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User Guide

Wireless N Gigabit Access Point

EAP120/EAP220

REV1.0.1
1910011120

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Chapter 1 Introduction

1.1 Overview of the EAP

EAP series products provide wireless coverage solutions for small-medium business. They can either work independently as standalone APs or implement centralized management with cluster function, providing a flexible, richly-functional but easily-configured enterprise-grade wireless network for small and medium business.

"Celling lamp" appearance and easily mounting design with chassis make EAP easy to be installed on a wall or ceiling and blend in with most interior decorations. EAP120 and EAP220 support Power over Ethernet (PoE) to make effortless and flexible deployment for users.

With two built-in omnidirectional antennas, EAP120 works within the 2.4GHz frequency band. It applies 802.11 standards and 2*2MIMO technology, allowing packet transmission at up to 300MHz.

EAP220 has four built-in omnidirectional antennas. Wireless network created by EAP220 can operate at both 2.4GHz and 5GHz. It applies 802.11n standard and two 2*2MIMO technology, allowing packet transmission at up to 600MHz (300MHz per radio).

1.2 Appearance Description

1.2.1 Top View

The top view of EAP120/EAP220 is shown as the following figure.

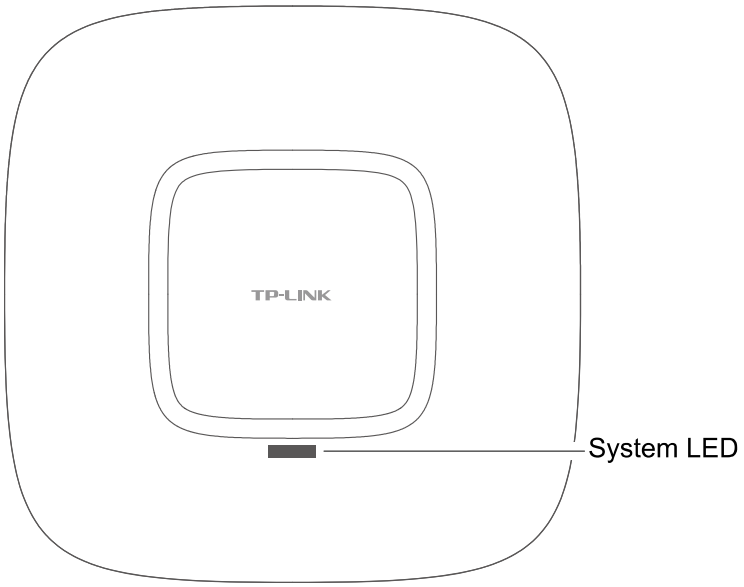


Figure 1-1 Top View of the EAP

- **LED**

  There is a System LED on the top of the EAP. The following table explains the indications of different LED colors.

LED Color	Indication
Flashing green	System initialization is complete.
Solid green	The device is working properly.
Flashing red	System errors. RAM, flash, Ethernet, WLAN or firmware may be malfunctioning.
Flashing yellow	Firmware update is in progress. Do not disconnect or power off the device.
Alternating red/green/yellow twice	The device is being reset.

1.2.2 Panel Layout

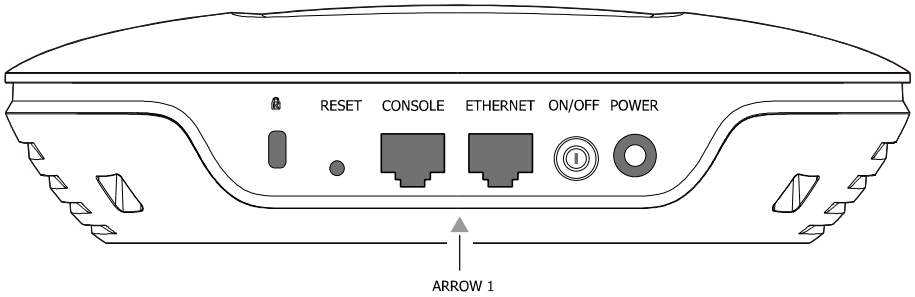


Figure 1-2 Panel Layout of the EAP

The interface panel components of the EAP, from left to right, are described in the following list:

- **Kensington Security Slot:** Secure the lock (not provided) into the security slot to prevent the device from being stolen.
- **RESET:** With the device powered on, press and hold the RESET button for about 8 seconds until the LED flashes Red/Green/Yellow alternatively twice, then release the button. The device will restore to factory default settings.
- **CONSOLE:** This port is used to connect with the serial port of a computer or a terminal to check and monitor system information of the device.
- **ETHERNET:** This port is used to connect to a router to transmit data or to a PSE device, such as a switch, for both data transmission and Power over Ethernet (PoE) through Ethernet cabling.
- **ON/OFF:** Press this button to turn on/off the device. Please remember to press it to use the device.
- **POWER:** The power port is used connect the device to an electrical wall outlet via power adapter. Please only use the provided power adapter.

- **ARROW 1:** This arrow is used to align with ARROW 2 on the mounting bracket to lock the EAP into place.

1.2.3 Mounting Bracket

The following figure describes the structure of the mounting bracket.

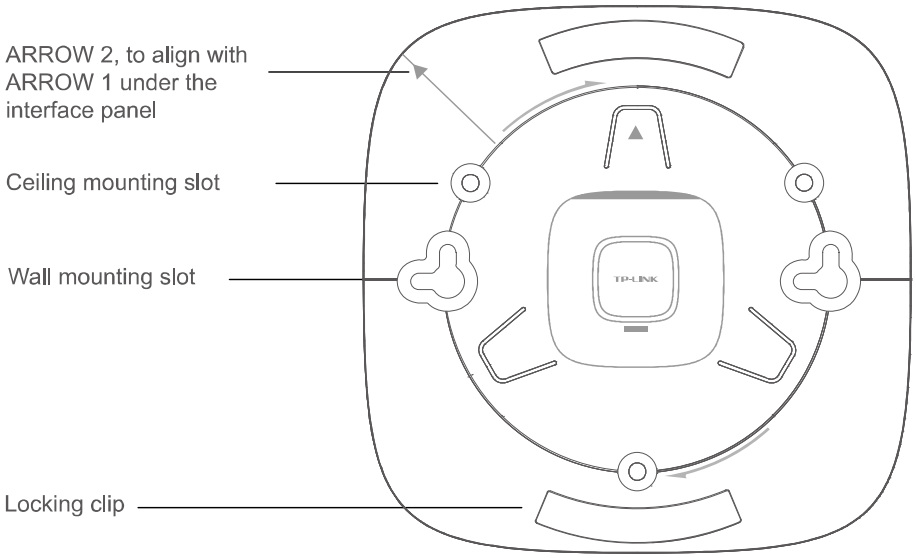


Figure 1-3 Structure of the Mounting Bracket

Chapter 2 Typical Topology

Typical topology for the EAP is described below.

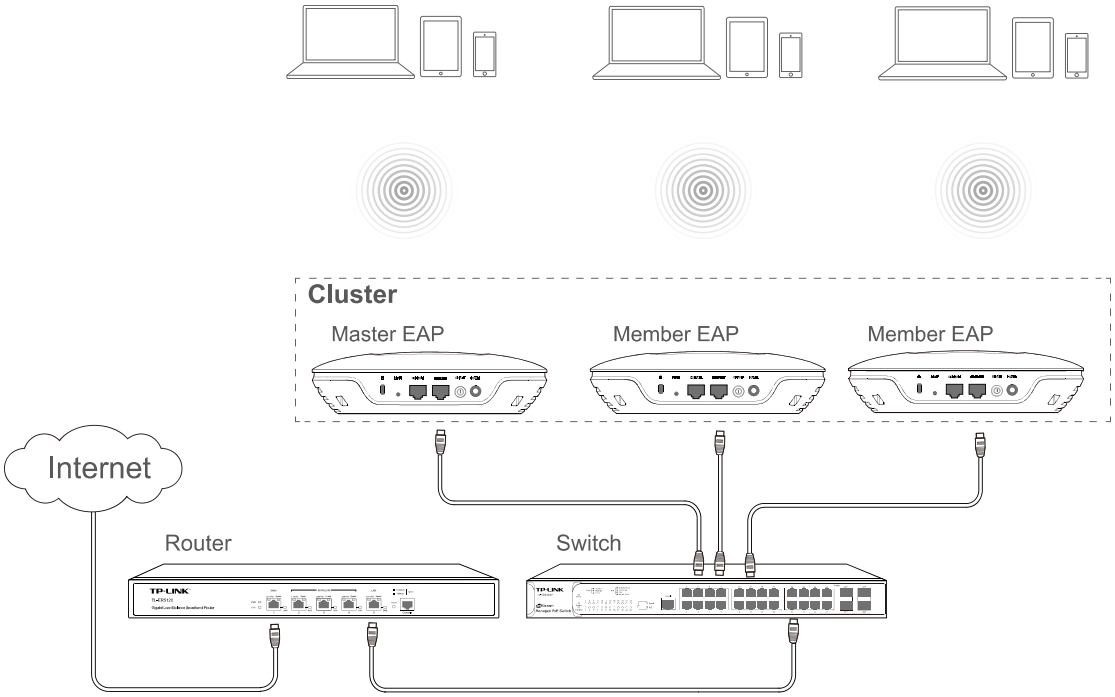


Figure 2-1 Typical Topology

The EAP120 and EAP220 provide two management modes: Cluster and Standalone. By default，the management mode is Cluster. In this mode, all EAPs in the same LAN will form a cluster, and a Master EAP will be elected among them to manage other EAPs, called Member EAPs.

A DHCP server is required in the local network to assign IP addresses to the EAPs. A router usually acts as the DHCP server.

Typically, a Power over Ethernet (PoE) switch can be used to provide power to each EAP; otherwise power adapter must be used.

Chapter 3 Getting Started with the EAP

The following content will guide you to quickly set up a wireless network connection with several EAPs, and login to the management page to configure the EAPs. The management host can be connected to the Master EAP wirelessly or with wires. Wireless Login is conveniently recommended.

Option 1: Wireless Login

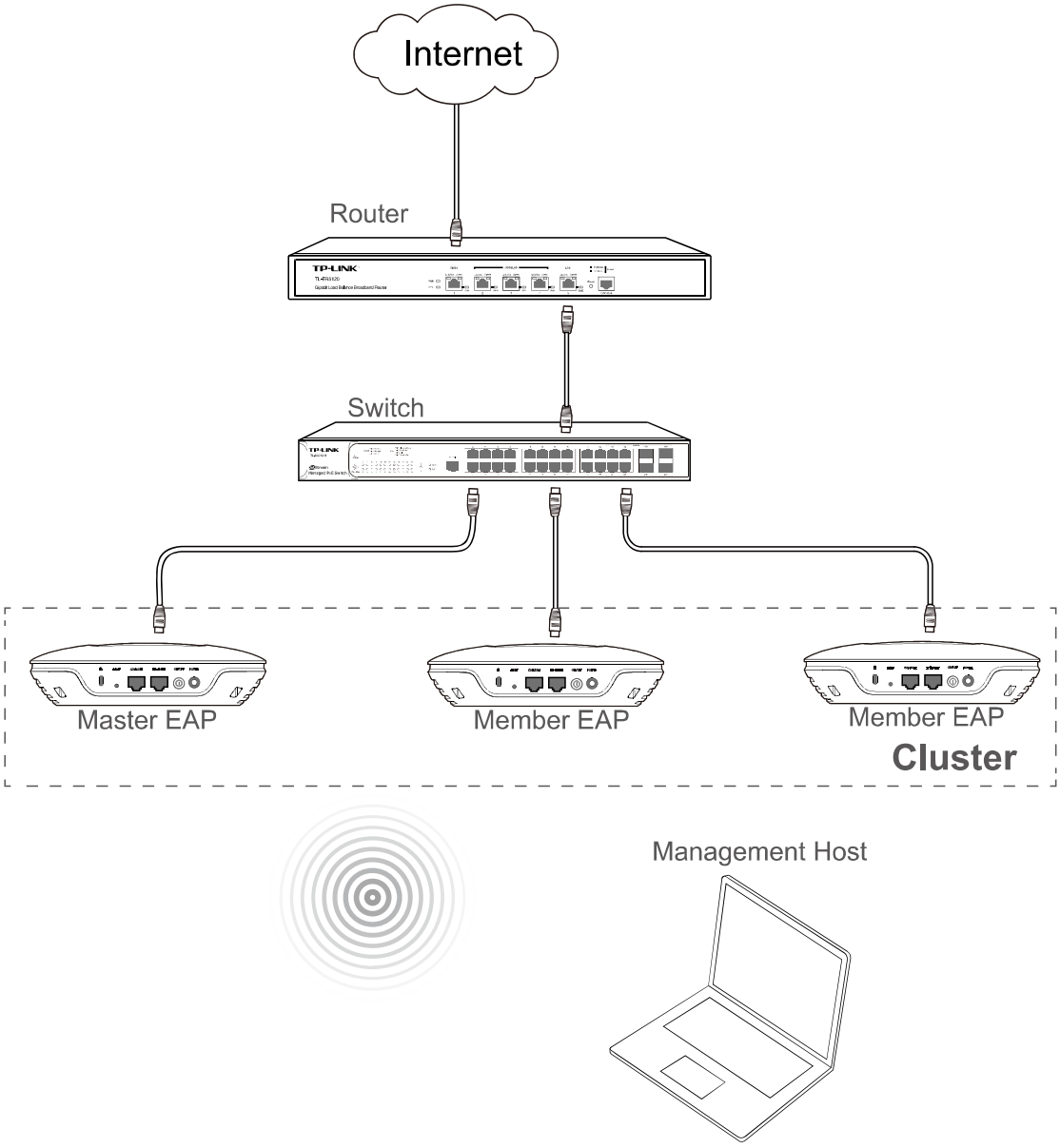


Figure 3-1 Sample Network Diagram for Wireless Login

Step 1: Power on

Power on the EAPs. The EAP with system initialization completed first will be elected as the Master EAP.

Step 2: Wireless Access

1. Make sure the management host is set to **obtain IP address automatically**.
2. Join the wireless network using the default SSID TP-LINK_2.4GHz_XXXXXX or TP-LINK_5GHz_XXXXXX, where XXXXXX represents the last 6 characters of the EAP's MAC address. Password is not required.

Step 3: Quick Setup

1. Open a web browser and type in http://tplinkeap.net to access the EAP's web management page. Use **admin** (all lowercase) for both username and password to login. Please note that in Cluster mode, the login will be directed to the Master EAP.
2. Create a new user name and password.
3. Follow the step-by-step instructions to complete the Quick Setup. Any configurations you make on the Master EAP will automatically synchronize to all the other EAPs.

Congratulations! Now you can enjoy the wireless network.

If you want to perform more configurations, please connect to the new SSID.

Option 2: Wired Login

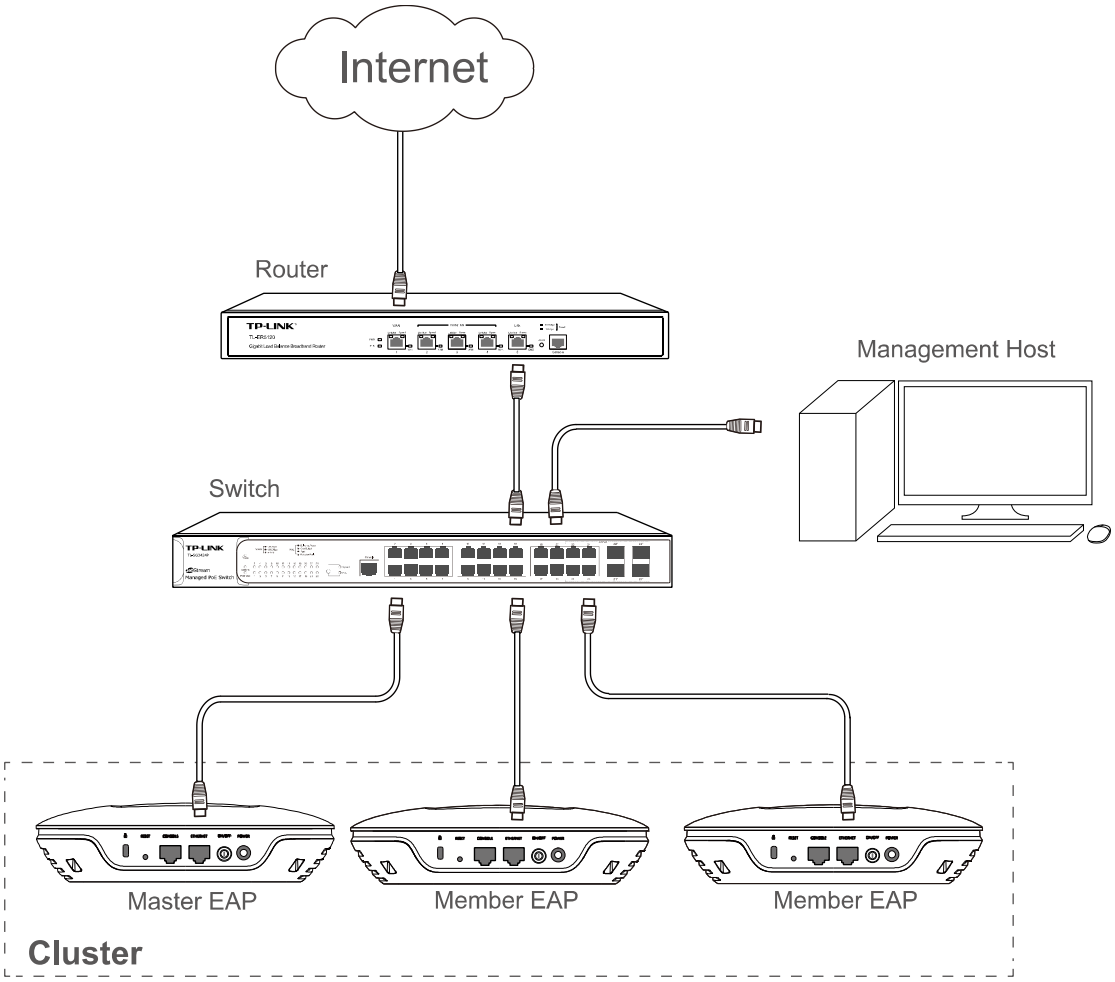


Figure 3-2 Sample Network Diagram for Wired Login

Step 1: Power on

Power on the EAPs. The EAP with system initialization completed first will be elected as the Master EAP.

Step 2: Wired Access

1. Make sure the management host is set to **obtain IP address automatically**.
2. Access your DHCP server and locate the IP address of the EAPs.

Step 3: Quick Setup

1. Open a web browser, in the address field type in any IP address of the EAPs to log in the web server. The default user name and password are **admin** (all lowercase). In the Cluster mode, the login will be directed to the Master EAP.
2. Create a new user name and password.

3. Follow the step-by-step instructions to complete Quick Setup. Any configurations you make on the Master EAP will automatically synchronize to all the other EAPs.

Congratulations! Now you can enjoy the wireless network.

Chapter 4 Management Mode

Wireless N Gigabit Access Point EAP120/EAP220 provides two management modes: Cluster and Standalone.

When user establishes a large-scale wireless network, the management of every single AP in the network is complex and complicated. The Cluster mode is recommended for the centralized management of EAPs in a large wireless network. In this mode, all the EAPs in this network can work in AP operating mode to provide wireless access service.

The Standalone mode applies to a relatively small-sized wireless network. EAPs in the Standalone mode cannot be managed centrally.

With factory default settings, the EAP works in Cluster mode. Switch the two management modes of the EAP based on the actual situations.

4.1 Mode Identification

How to judge the management mode of the EAP? The web management pages of the EAP in the Cluster and Standalone mode are different. In Cluster mode, there is a Cluster tab, while in Standalone mode, there is a Network tab as shown below.

- **Cluster**

The web management page of the EAP in Cluster mode.

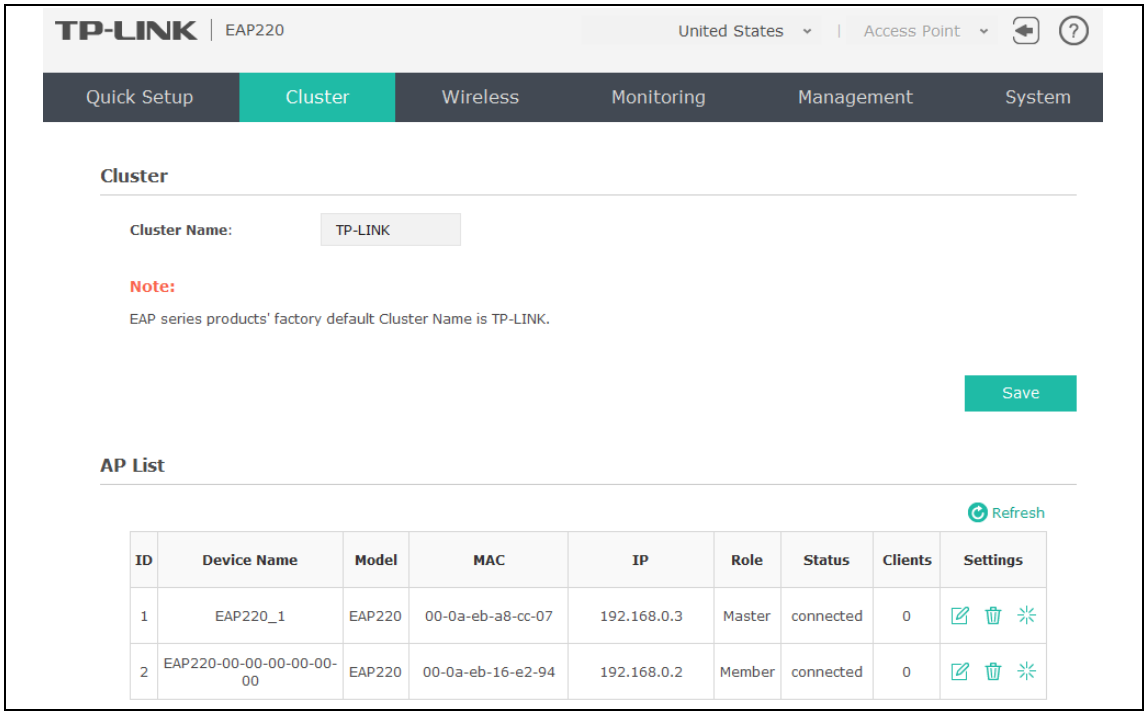


Figure 4-1 Web Management Page in Cluster Mode

- **Standalone**

The web management page of the EAP in Standalone mode.

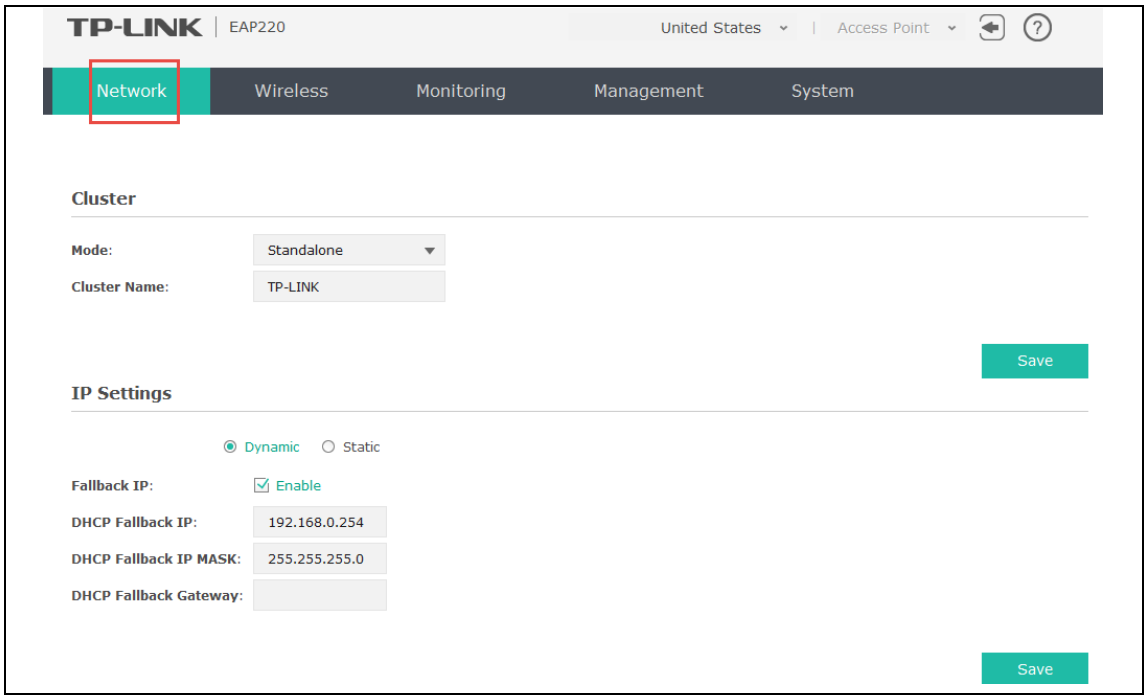


Figure 4-2 Web Management Page in Standalone Mode

4.2 Mode Switching

The management mode Cluster and Standalone can be switched with each other on every single EAP. The switching operation is shown below.

4.2.1 Switch to Standalone

Log in to the web management page, click **Cluster** in the navigation tab when the EAP works in Cluster mode. AP List will be displayed as shown below.

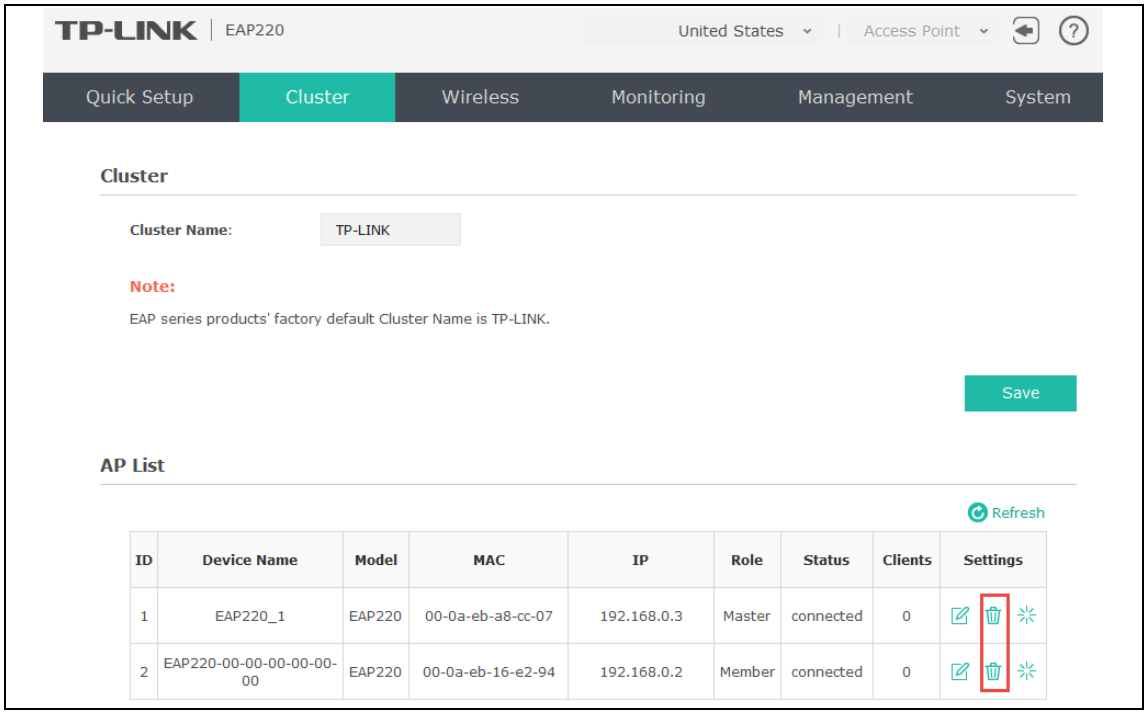


Figure 4-3 Delete an EAP from a Cluster

1. Select the specified EAP in the AP list and click the icon in the Settings column.
2. If the deleted EAP is a Member (shown in the Role column) in the cluster, the mode will switch to Standalone. To know how to log in to the Member's web management page, refer to Chapter 3 Getting Started with the EAP. If the deleted EAP is a Master in the cluster, the management mode will switch to Standalone and the login window will pop up.

NOTE:

For detailed information of the Master EAP and Member EAP, please refer to Chapter 5 Cluster.

4.2.2 Switch to Cluster

Log in to the web management page, click **Network** in the navigation tab when the EAP works in Standalone mode. The following content will be displayed.

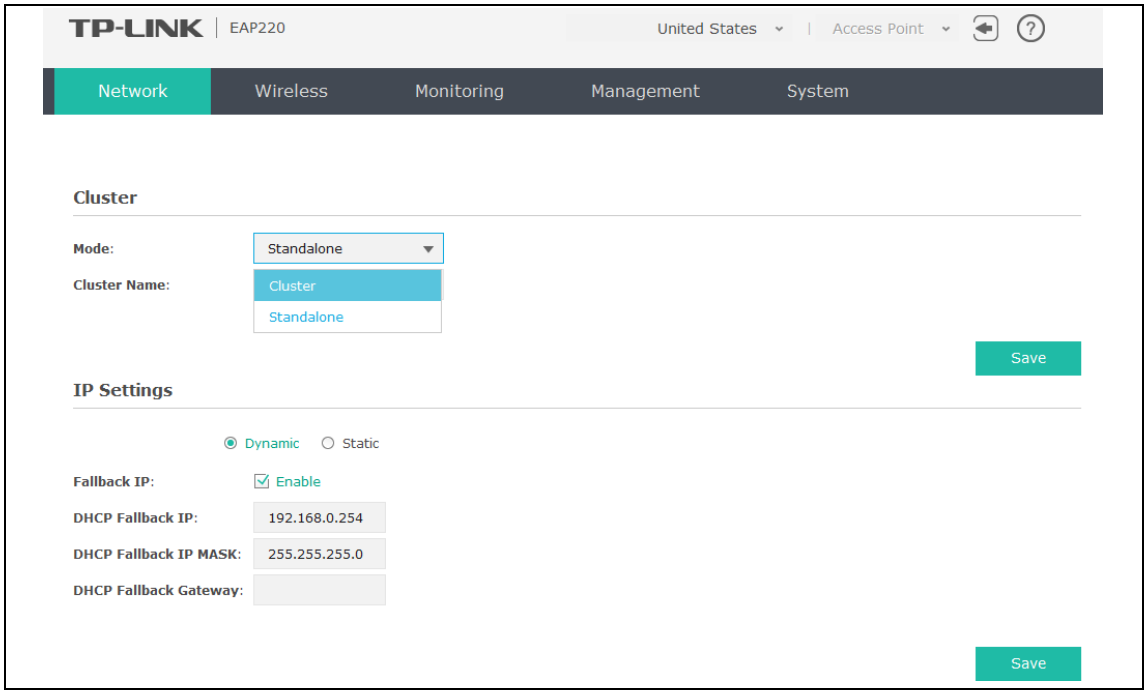


Figure 4-4 Join a Cluster

1. Select the Mode as Cluster and enter a cluster name to join the cluster.
2. Click **Save** and the EAP will reboot and search the cluster with the same cluster name to join. If there is no device with the same cluster name in the network, the EAP will create a new cluster with this name and act as the Master.

Chapter 5 Cluster

Cluster feature provides centralized management and monitoring of the EAPs, thus significantly simplifying the wireless network configuration and maintenance.

By default, the EAPs in a same subnet will form a cluster automatically. One EAP will be elected as the Master EAP, through which you can manage all the EAPs in this cluster centrally, while the other EAPs work as Members.

Master election determines the role of the cluster members. Master election is held each time the cluster is newly formed or the former Master works abnormally.

The Master is elected based on the following rules in the order listed:

1. **System Uptime**: The EAP with the longest system uptime becomes the Master. Uptime is the time that has elapsed since the last reboot.
2. **MAC Address**: The EAP with the highest MAC address becomes the Master.

In a cluster, access to any EAP's IP address in the web browser will be redirected to the Master EAP's management web page. Each EAP's private parameters such as Name, Radio, IP Settings, Load Balance and SSID Override can be customized in the AP list in Cluster page, while the global configurations including Wireless, Monitoring, Management and System on the Master EAP will be automatically synchronized across the cluster to all Member EAPs.

> ***NOTE:***
>
> By default, EAP works in the Cluster management mode and its operating mode is Access Point. You can remove the EAP from the cluster and switch it to Standalone mode if it is no longer planned to be managed by the cluster.

To form a cluster, make sure the following prerequisites or conditions are satisfied:

1. Be sure the EAPs forming a cluster are of the same model. EAP120 cannot cluster with EAP220.
2. Be sure all EAP devices prepared for a cluster are in the same network segment.
3. Be sure the number of EAPs in a cluster is no more than 24.
4. Be sure all EAP devices prepared for a cluster have the same cluster name. It is recommended to specify a new cluster name to prevent malicious EAPs from joining and even becoming Master of the cluster.

The Cluster page is shown below.

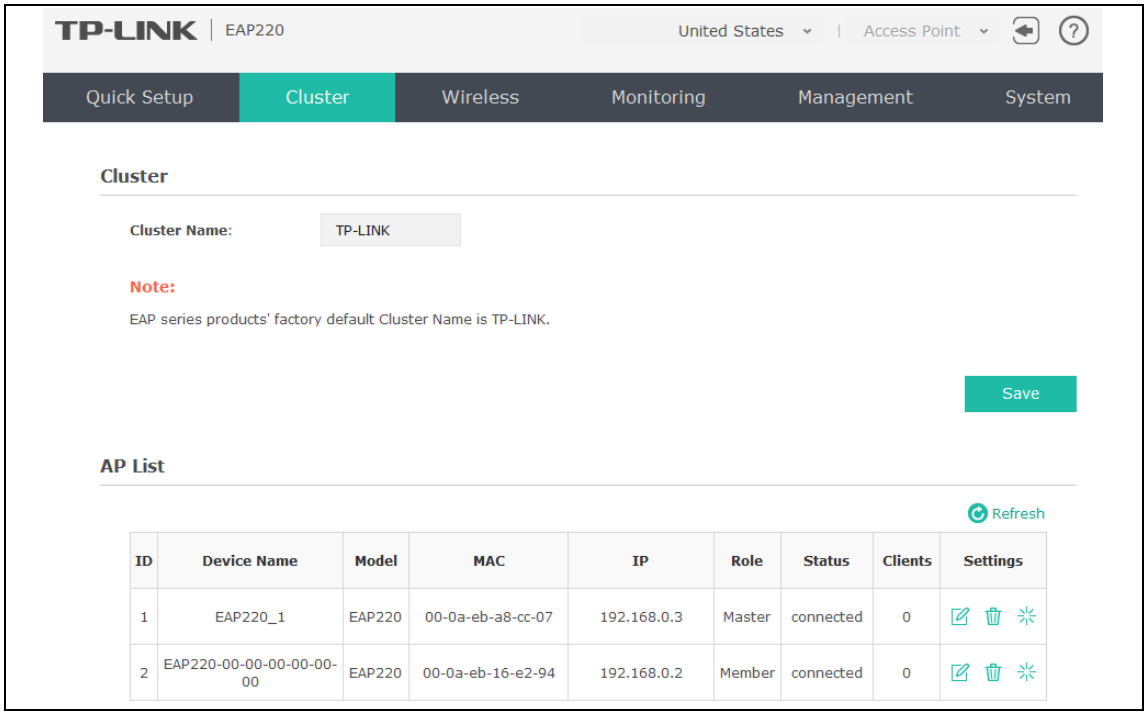


Figure 5-1 Cluster Page

5.1 Cluster

Customize the cluster name in this zone. The cluster name will be synchronized automatically across the cluster to all Member EAPs. The EAPs have to have the same cluster name to form a cluster.

Figure 5-2 Modify the Cluster Name

5.2 AP List

AP List displays all the EAPs in this cluster. Click in the Settings column to configure the private parameters of the selected EAP. These private parameters take effect on each EAP separately, which helps to optimize the network performance. Configurable parameters include Device Name, Radio, IP Settings, Load Balance and SSID Override.

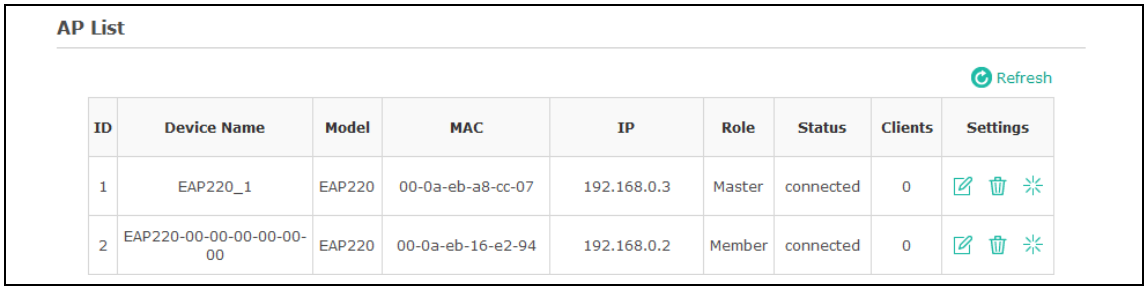


Figure 5-3 AP List

Device Name:	Displays the name of the device. The default format of device name is "model-MAC address" (such as EAP220-00-0a-eb-16-e2-90).
Model:	Displays the model of the device.
MAC:	Displays the MAC address of the device.
IP:	Displays the IP address of the EAP. By default, it is obtained from a DHCP server (typically a router).
Role:	Displays the role of the EAP in a cluster, including Master and Member.
Status:	Displays the status of an EAP in a cluster, including connected and joining. • **Connected**: The EAP has joined a cluster. • **Joining**: The EAP is trying to join a cluster.
Clients:	Displays the number of wireless devices connected to the EAP.
Settings:	Operations here are only valid for a specific EAP. : Click to configure the parameters of the EAP. : Click to remove the EAP from the cluster, thus the management mode of the removed EAP will switch to Standalone. : Click to reboot the EAP.

Click to configure the wireless parameters of a specific EAP. The following content will be shown.

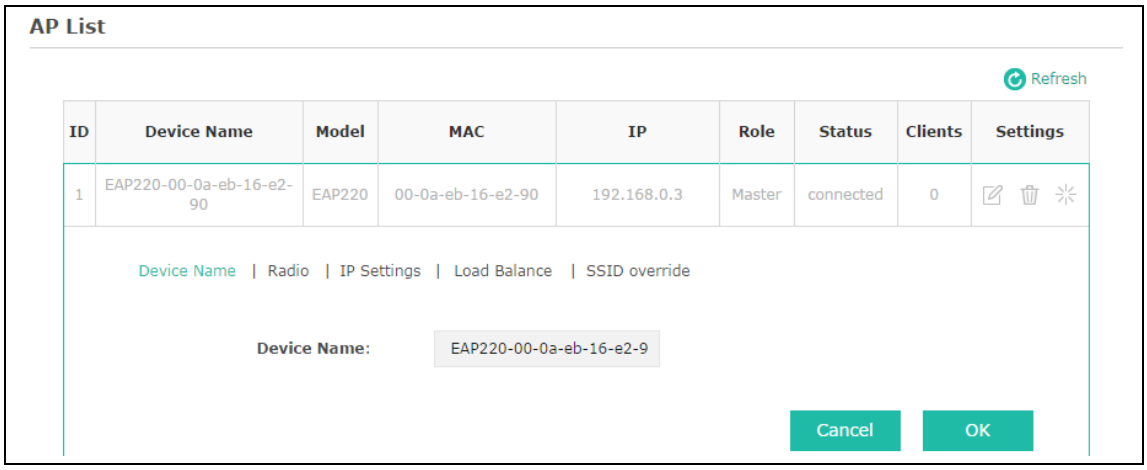


Figure 5-4 Configure the Wireless Parameters

- **Device Name**

You can rename the EAP like "EAP220_1" to distinguish it from others. The name can be 1 to 31 characters long. Then click **OK**.

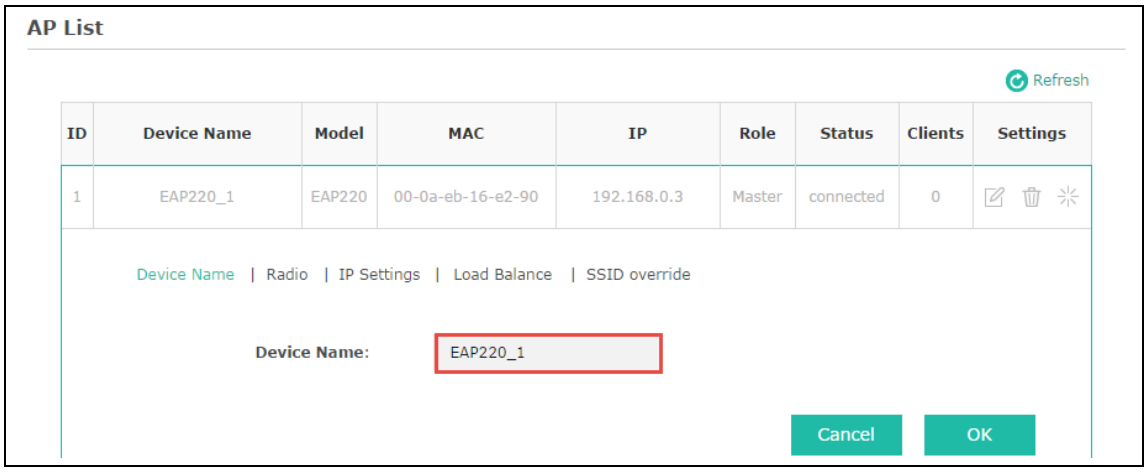


Figure 5-5 Rename the Device

- **Radio**

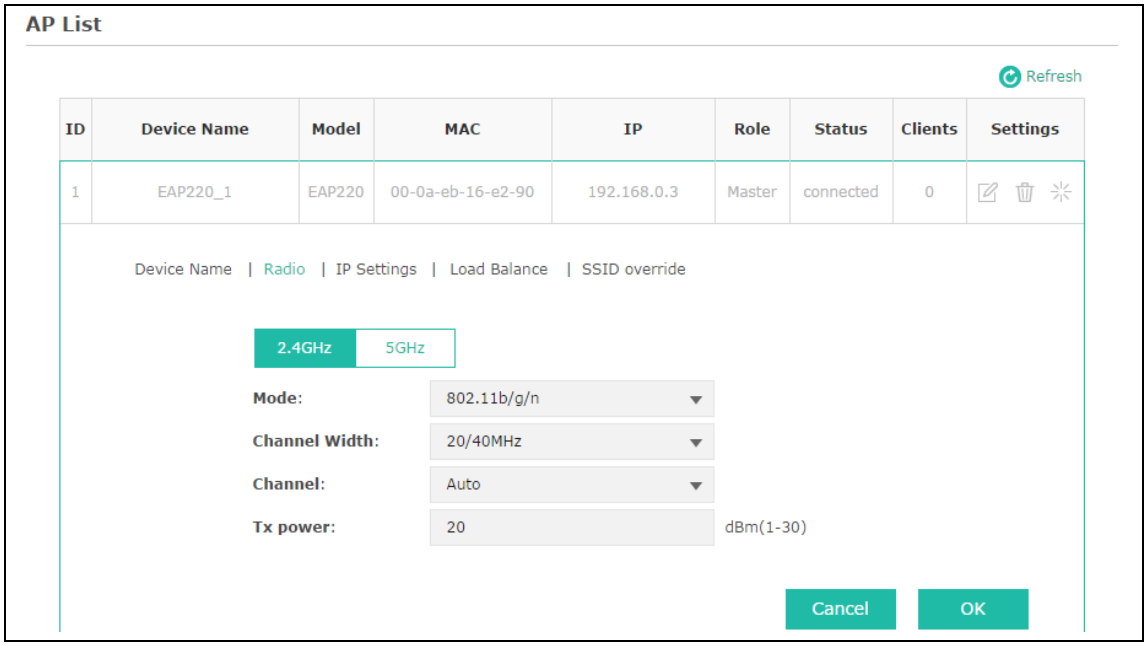


Figure 5-6 Radio

2.4GHz/5GHz:	Select a frequency band.
Mode:	Choose the protocol standard for the wireless network. Wireless network created by EAP120 is able to operate in the 2.4GHz frequency, while for EAP220 the wireless network can work within 2.4GHz and 5GHz frequency. Both EAP120 and EAP220 support 802.11b/g/n, 802.11b/g, and 802.11n standards. It is recommended to select 802.11b/g/n, in which way clients supporting 11b, 11g or 11n mode can access your wireless network. Wireless network of EAP220 operating at 5GHz frequency band supports 802.11a, 802.11n and 802.11a/n standards. It is recommended to select 802.11a/n, in which way your wireless network can be connected by clients supporting11a or 11n mode.
Channel Width:	Select the channel width of this device. Options include 20MHz, 40MHz and 20/40MHz (this device automatically selects 20MHz or 40MHz, and 20MHz will be used if 40MHz is not available). According to IEEE 802.11n standard, using a channel width of 40MHz can increase wireless throughput. However, users may choose lower bandwidth due to the following reasons: 1. To increase the available number of channels within the limited total bandwidth. 2. To avoid interference from overlapping channels occupied by other devices in the environment. 3. Lower bandwidth can concentrate higher transmit power, increasing stability of wireless links over long distances.

Channel:	Select the channel used by this device to improve wireless performance. 1/2412MHz means the Channel is 1 and the frequency is 2412MHz. The channel number varies in different regions. By default, channel is automatically selected.
Tx Power:	Enter the transmit power value. By default, the value is 20. The maximum transmit power may vary among different countries or regions. If the maximum transmit power is set to be larger than local regulation allows, the maximum Tx power regulated will be applied in actual situation. ***NOTE:*** In most cases, it is unnecessary to select maximum transmit power. Selecting larger transmit power than needed may cause interference to neighborhood. Also it consumes more power and will reduce longevity of the device. Select a certain transmit power is enough to achieve the best performance.

- ## IP Settings

You can allocate the EAP a static IP address or set it to obtain an IP address automatically from a DHCP server. By default, the EAP is set to obtain IP address automatically, thus a DHCP server is required in the network.

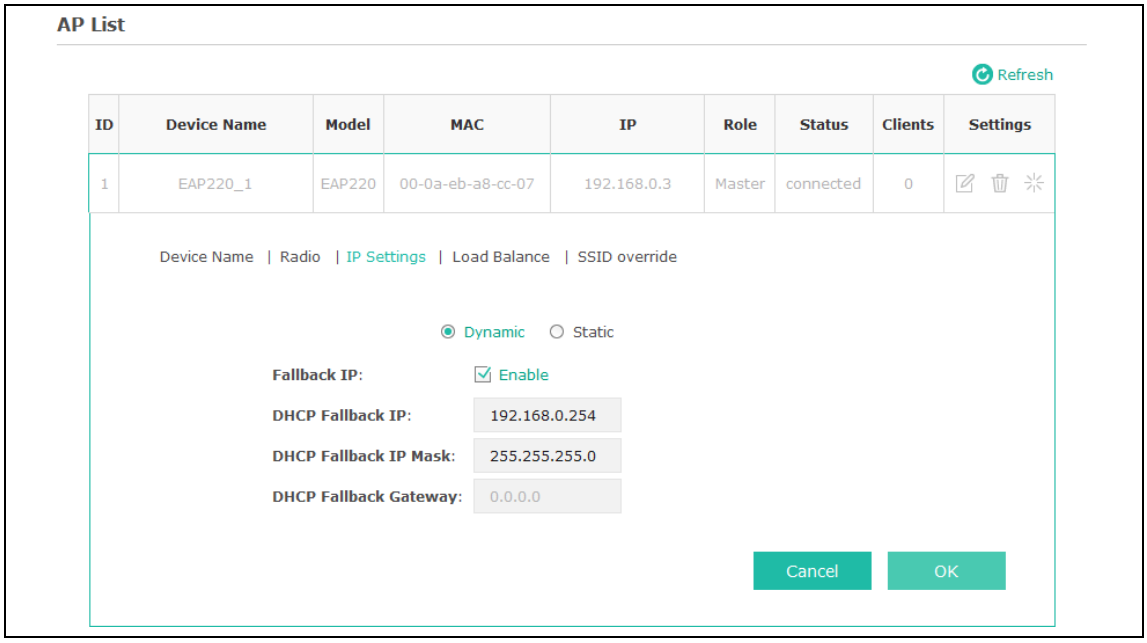


Figure 5-7 IP Settings

Dynamic/Static:	By default, the EAP device receives an IP address from a DHCP server (typically a router). Select Static to configure IP address manually.
Fallback IP:	If the EAP fails to get a dynamic IP address from a DHCP server within ten seconds, the fallback IP will work as the IP address of the device.

	After that, however, the device will keep trying to obtain an IP address from the DHCP until it succeeds.
DHCP Fallback IP/IP Mask:	Enter the fallback IP/IP mask.
DHCP Fallback Gateway:	Enter the fallback gateway.

- ## Load Balance

In a network with a great number of wireless clients, there may be a great disparity in the number of clients connected to each AP, which may waste the network resources and reduce the network performance. By restricting the maximum number of the wireless clients connected to an EAP, Load Balance helps to reduce the traffic loading and enhance the network performance.

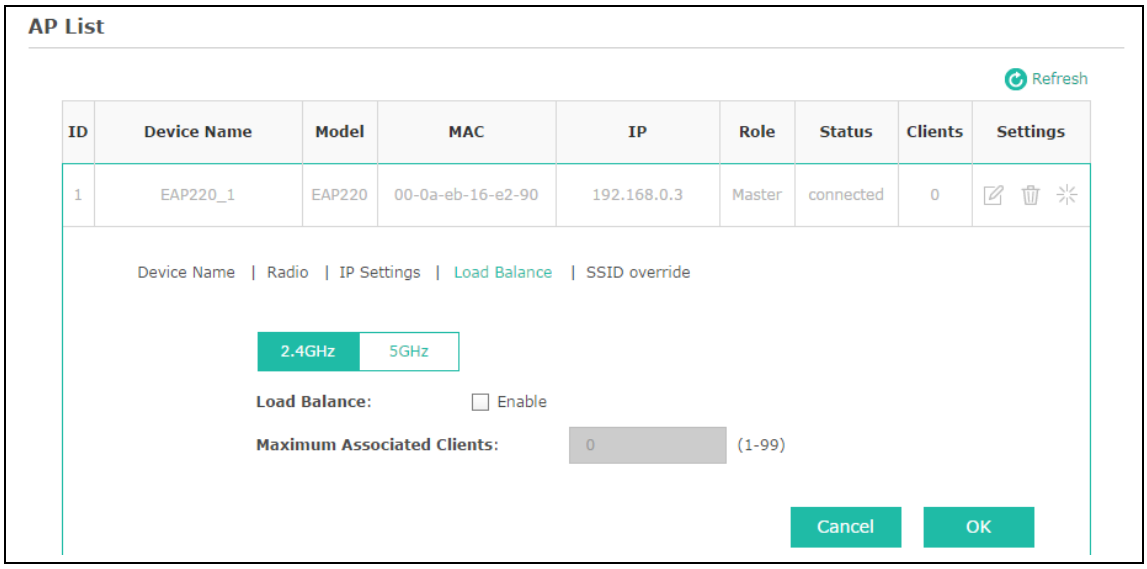


Figure 5-8 Load Balance

2.4GHz/5GHz:	Select a frequency band.
Load Balance:	Disable by default. Check the box to enable the function. Then you can set a number for maximum associated clients to control the wireless access.
Maximum Associated Clients:	Enter the number of clients to be allowed for connection to the EAP. The number ranges from 1 to 99.

- ## SSID Override

Customize the wireless network's SSID to distinguish it from the cluster's Service Set Identifier (SSID), which will help to locate this AP in the wireless network list. Meanwhile, wireless network can be divided into a specific VLAN based on the SSID. In a network with the same SSID, clients

under the same VLAN can communicate with each other while clients of different VLANs are separated.

Click , the following content will be shown.

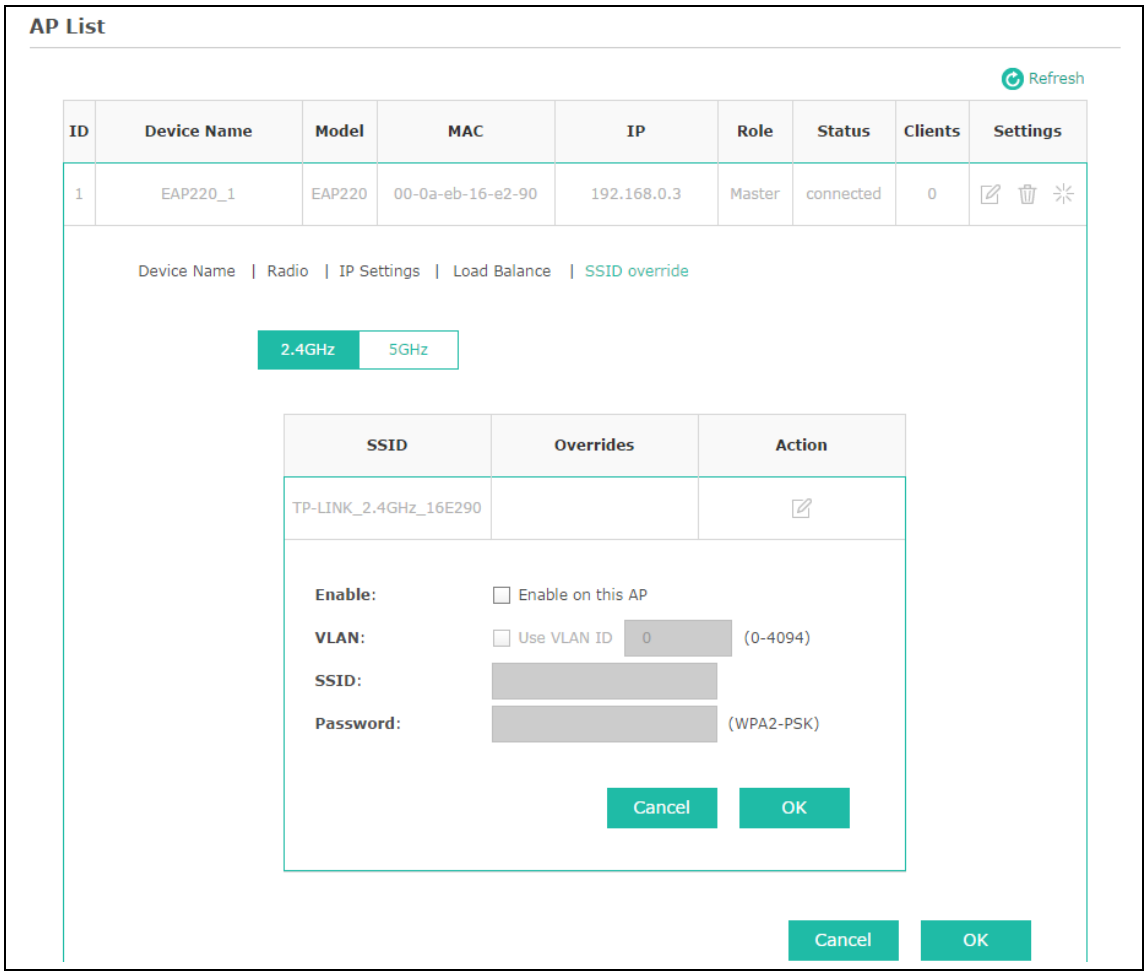


Figure 5-9 SSID Override

Enable:	Check the box to enable SSID Override.
VLAN:	Check the box to enable VLAN and set a VLAN ID (ranges from 0 to 4094) to the wireless network. VLAN 0 means VLAN function is disabled. Wireless networks with the same VLAN ID are grouped to a VLAN.
SSID:	Enter an easily-identified SSID to override the SSID shared with other clustered EAPs.
Password:	Set a WPA2-PSK password to access the wireless network. Only previous passwords with PSK encryption can be overridden.

Chapter 6 Network

On Network page you can switch the EAP's management mode to Cluster and configure its IP address.

Network page is only available in Standalone mode.

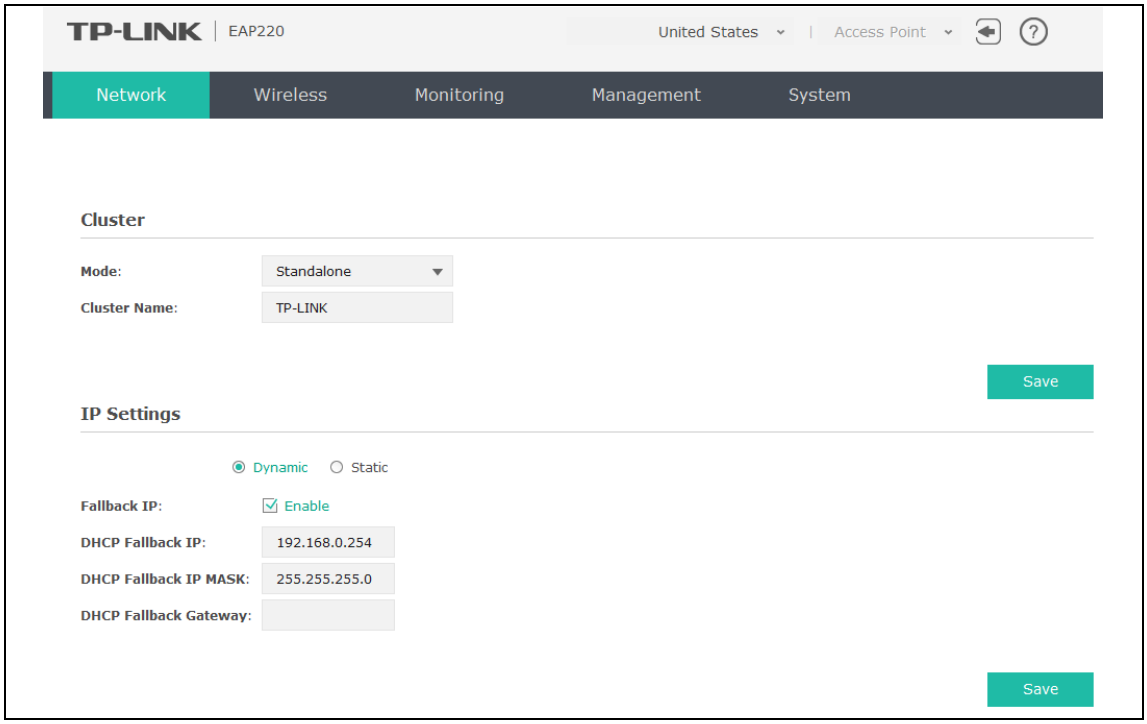


Figure 6-1 Network Page

6.1 Cluster

Figure 6-2 Switch to Cluster Mode

Mode:	Select **Cluster** from the drop-down list and click **Save**, the management mode will be changed to Cluster.
Cluster Name:	Enter the name of the cluster the EAP is planned to join.

6.2 IP Settings

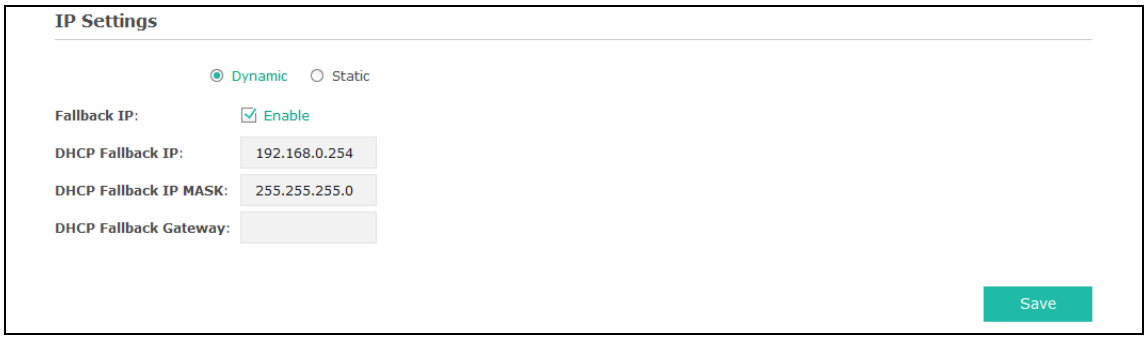


Figure 6-3 IP Settings

Dynamic/Static:	By default, the EAP device obtains an IP address from a DHCP server (typically a router). Select Static to configure IP address manually.
Fallback IP:	If the EAP fails to get a dynamic IP address from a DHCP server within ten seconds, the fallback IP will work as the IP address of the device. After that, however, the device will keep trying to obtain an IP address from the DHCP server until it succeeds.
DHCP Fallback IP/IP MASK:	Enter the fallback IP/IP mask.
DHCP Fallback Gateway:	Enter the fallback gateway.

Chapter 7 Wireless

Wireless page, consisting of Wireless Settings, Portal, MAC Filtering, Scheduler, QoS and Rogue AP Detection, is shown below.

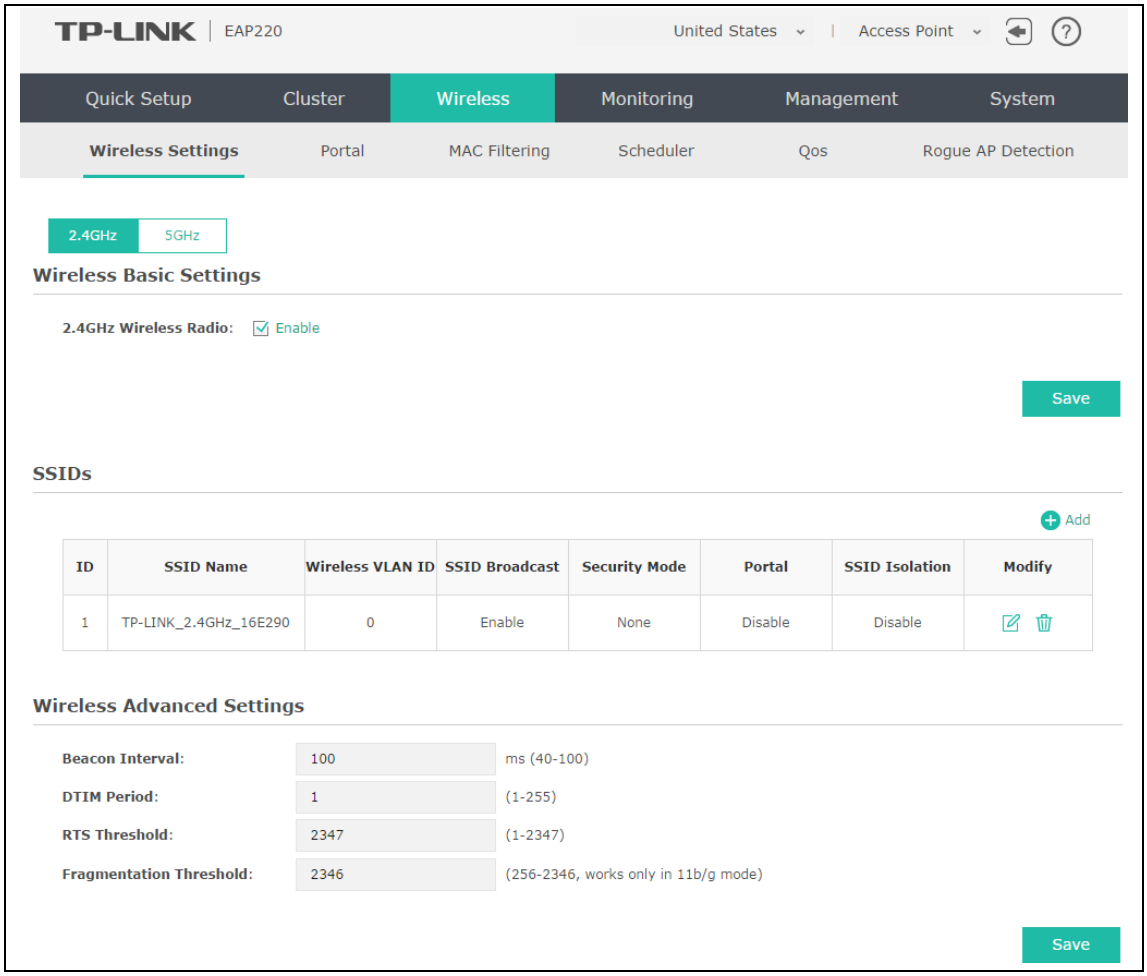


Figure 7-1 Wireless Page

7.1 Wireless Settings

Following is the page of Wireless Settings.

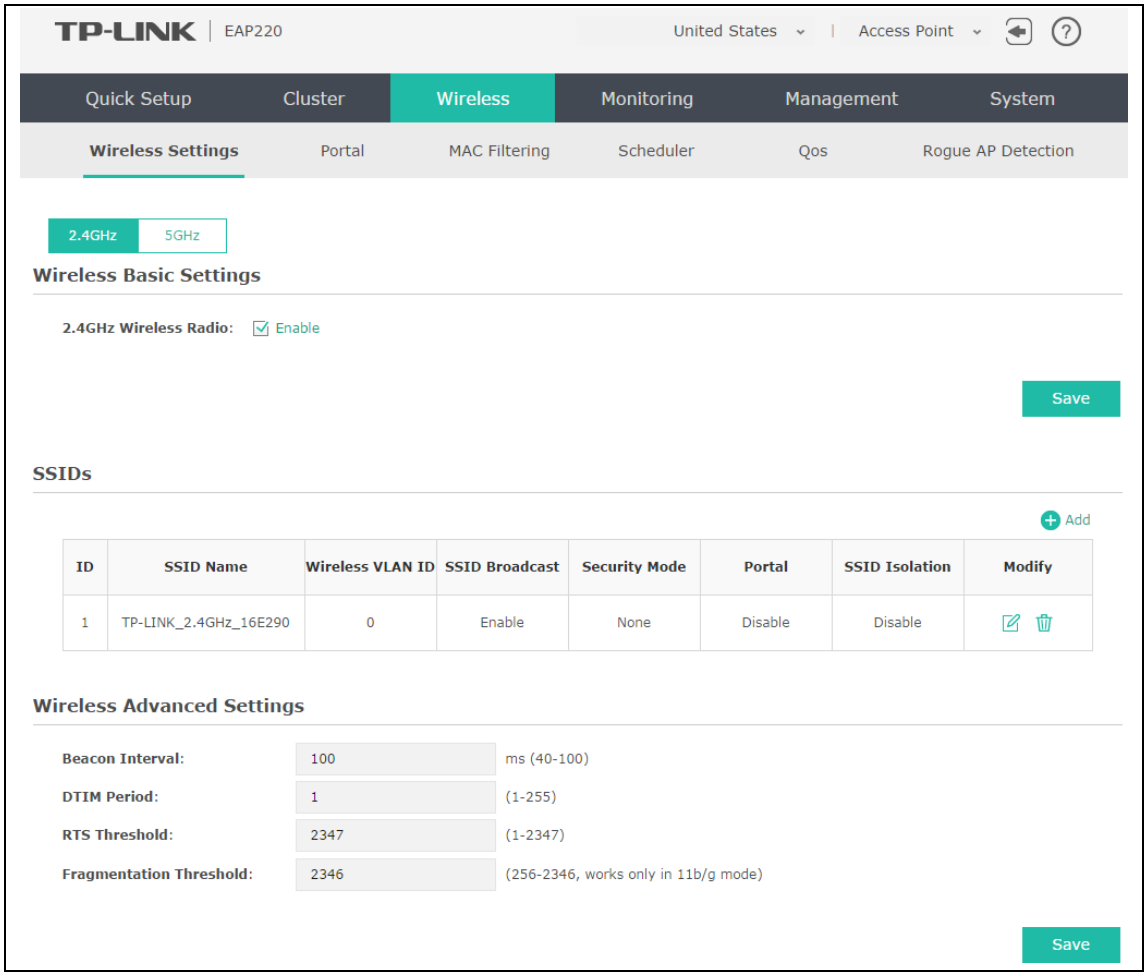


Figure 7-2 Wireless Settings Page

2.4GHz/5GHz: Select a frequency band.

7.1.1 Wireless Basic Settings

In Cluter mode, parameters in Figure 7-3 including Wireless Mode, Channel Width, Channel and Tx Power are not available.

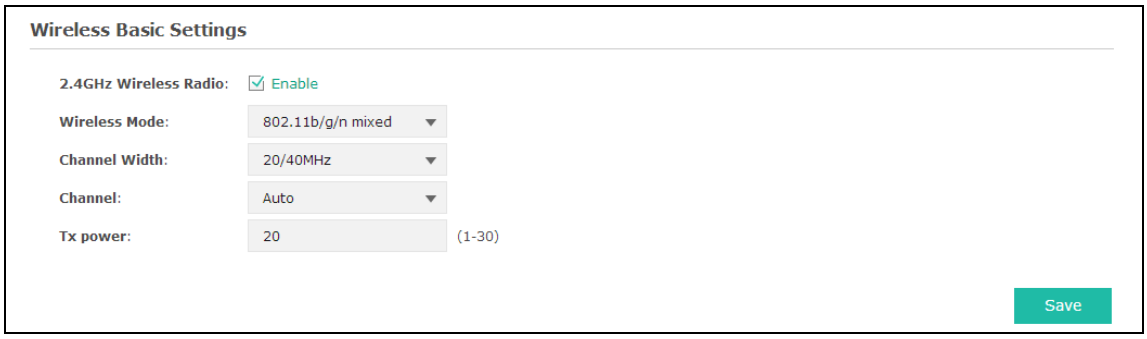


Figure 7-3 Wireless Basic Settings

2.4GHz Wireless Radio:	Check the box to enable 2.4GHz Wireless Radio.
Wireless Mode:	Select the protocol standard for the wireless network. Wireless network created by EAP120 is able to operate in the 2.4GHz frequency, while for EAP220 the wireless network can work within 2.4GHz and 5GHz frequency. Both EAP120 and EAP220 support 802.11b/g/n, 802.11b/g, and 802.11n standards. It is recommended to select 802.11b/g/n, in which way clients supporting 11b, 11g or 11n mode can access your wireless network. Wireless network of EAP220 operating at 5GHz frequency band supports 802.11a/n, 802.11a and 802.11n standards. It is recommended to select 802.11a/n, in which way your wireless network can be connected by clients supporting 11a or 11n mode.
Channel Width:	Select the channel width of this device. Options include 20MHz, 40MHz and 20/40MHz (this device automatically selects 20MHz or 40MHz, and 20MHz will be used if 40MHz is not available). According to IEEE 802.11n standard, using a channel width of 40MHz can increase wireless throughput. However, users may choose lower bandwidth due to the following reasons: 1. To increase the available number of channels within the limited total bandwidth. 2. To avoid interference from overlapping channels occupied by other devices in the environment. 3. Lower bandwidth can concentrate higher transmit power, increasing stability of wireless links over long distances.
Channel:	Select the channel used by this device to improve wireless performance. 1/2412MHz means the Channel is 1 and the frequency is 2412MHz. The channel number varies in different regions. By default, channel is automatically selected.
Tx power:	Enter the transmit power value. By default, the value is 20. The maximum transmit power may vary among different countries or regions. If the maximum transmit power is set to be larger than local regulation allows, the maximum Tx power regulated will be applied in actual situation. ***NOTE:*** In most cases, it is unnecessary to select maximum transmit power. Selecting larger transmit power than needed may cause interference to neighborhood. Also it consumes more power and will reduce longevity of the device. Select a certain transmit power is enough to achieve the best performance.

7.1.2 SSIDs

SSIDs can work together with switches supporting 802.1Q VLAN. The EAP can build up to eight virtual wireless networks per radio for users to access. At the same time, it adds different VLAN

tags to the clients which connect to the corresponding wireless network. It supports maximum 8 VLANs per radio. The clients in different VLAN cannot directly communicate with each other.

Clients connected to the device via cable do not belong to any VLAN. Thus wired client can communicate with all the wireless clients despite the VLAN settings.

Click in the Modify column, the following content will be shown.

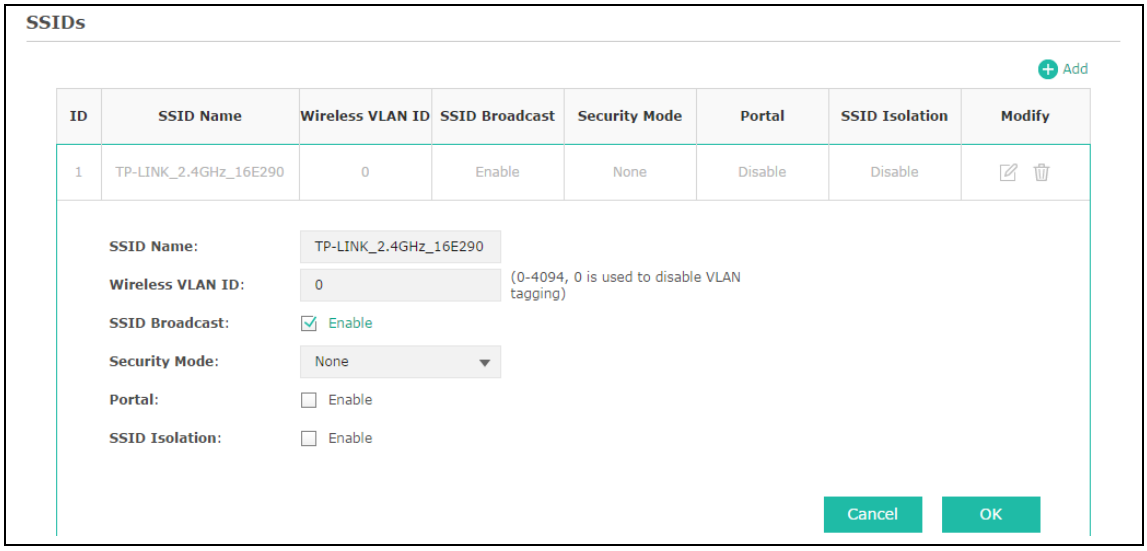


Figure 7-4 SSIDs

Add	Click to add up to 8 wireless networks per radio.
SSID Name:	Enter up to 32 characters as the SSID name.
Wireless VLAN ID:	Set a VLAN ID (ranges from 0 to 4094) for the wireless network. VLAN 0 means VLAN function is disabled. Wireless networks with the same VLAN ID are grouped to a VLAN.
SSID Broadcast:	Enable this function, AP will broadcast its SSID to hosts in the surrounding environment, as thus hosts can find the wireless network identified by this SSID. If SSID Broadcast is not enabled, hosts must enter the AP's SSID manually to connect to this AP.
Security Mode:	Select the security mode of the wireless network. For the safety of wireless network, you are suggested to encrypt your wireless network. This device provides three security modes: **WPA-Enterprise**, **WPA-PSK** (WPA Pre-Shared Key) and **WEP** (Wired Equivalent Privacy). WPA-PSK is recommended. Settings vary in different security modes as the details are in the following introduction. Select **None** and the hosts can access the wireless network without password.
Portal:	Portal provides authentication service for the clients who want to access the wireless local area network. For more information, refer to 7.2 Portal. After Portal is enabled, the configurations in 7.2 Portal will be applied.

SSID Isolation:	After enabling SSID Isolation, the devices connected in the same SSID cannot communicate with each other.
Modify:	Click to open the page to edit the parameters of SSID. Click to delete the SSID.

Following is the detailed introduction of security mode: **WEP**, **WPA-Enterprise** and **WPA-PSK**.

- ## WEP

WEP (Wired Equivalent Privacy), based on the IEEE 802.11 standard, is less safe than WPA-Enterprise or WPA-PSK.

> ***NOTE:***
>
> WEP is not supported in 802.11n mode. If WEP is applied in 802.11n mode, the clients may not be able to access the wireless network. If WEP is applied in 11b/g/n mode (in the 2.4GHz frequency band) or 11a/n (in the 5GHz frequency band), the device may work at a low transmission rate.

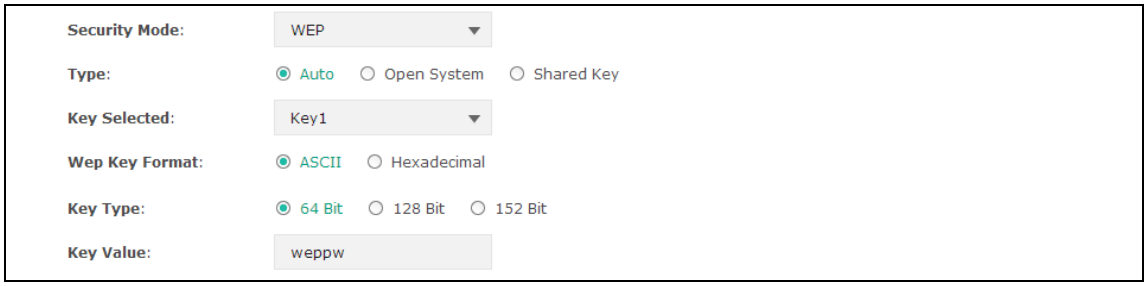


Figure 7-5 Security Mode_WEP

Type:	Select the authentication type for WEP. • **Auto**: The default setting is Auto, which can select Open System or Shared Key automatically based on the wireless station's capability and request. • **Open System**: After you select Open System, host in the wireless network can pass the authentication and associate with the wireless network without password. However, correct password is necessary for data transmission. • **Shared Key**: After you select Shared Key, host in the wireless network has to input password to pass the authentication, or it cannot associate with the wireless network or transmit data.
Key Selected:	You can configure four keys in advance and select one as the present valid key.
Web Key Format:	Select the web key format ASCII or Hexadecimal. • **ASCII**: ASCII format stands for any combination of keyboard characters in the specified length. • **Hexadecimal**: Hexadecimal format stands for any combination of hexadecimal digits (0-9, a-f, A-F) in the specified length.

Key Type:	Select the WEP key length (64-bit, or 128-bit, or 152-bit) for encryption. • **64-bit**: You can enter 10 hexadecimal digits (any combination of 0-9, a-f, A-F without null key) or 5 ASCII characters. • **128-bit**: You can enter 26 hexadecimal digits (any combination of 0-9, a-f, A-F without null key) or 13 ASCII characters. • **152-bit**: You can enter 32 hexadecimal digits (any combination of 0-9, a-f, A-F without null key) or 16 ASCII characters.
Key Value:	Enter the key value.

• WPA-Enterprise

Based on RADIUS server, WPA-Enterprise can generate different passwords for different users and it is much safer than WPA-PSK. However, it costs much to maintain and is more suitable for enterprise users. At present, WPA-Enterprise has two versions: WPA-PSK and WPA2-PSK.

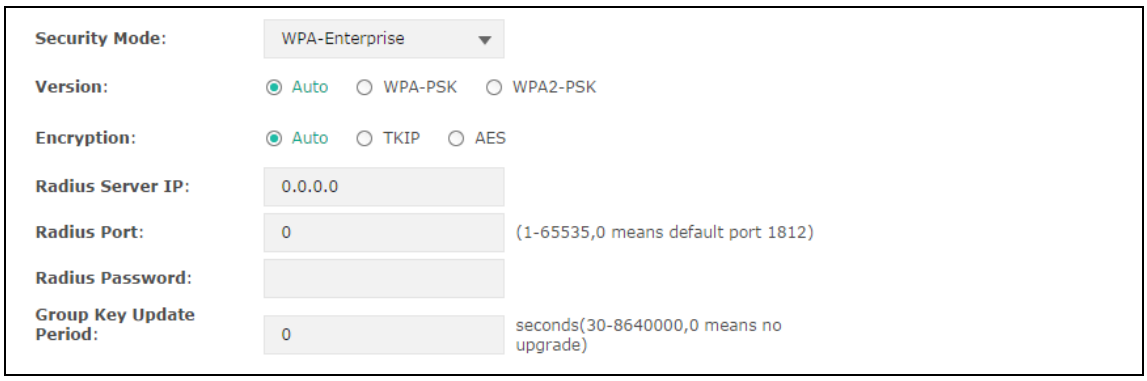


Figure 7-6 Security Mode_WPA-Enterprise

Version:	Select one of the following versions: • **Auto**: Select WPA-PSK or WPA2-PSK automatically based on the wireless station's capability and request. • **WPA-PSK**: Pre-shared key of WPA. • **WPA2-PSK**: Pre-shared key of WPA2.
Encryption:	Select the encryption type, including **Auto**, **TKIP**, and **AES**. The default setting is Auto, which can select TKIP (Temporal Key Integrity Protocol) or AES (Advanced Encryption Standard) automatically based on the wireless station's capability and request. AES is more secure than TKIP and TKIP is not supported in 802.11n mode. It is recommended to select AES as the encryption type.
RADIUS Server IP/Port:	Enter the IP address/port of the RADIUS server.
RADIUS Password:	Enter the password to access the RADIUS server.

Group Key Update period:	Specify the group key update period in seconds. The value can be either 0 or at least 30. 0 means no update.

NOTE:

Encryption type TKIP is not supported in 802.11n mode. If TKIP is applied in 802.11n mode, the clients may not be able to access the wireless network of the EAP. If TKIP is applied in 11b/g/n mode (in the 2.4GHz frequency band) or 11a/n (in the 5GHz frequency band), the device may work at a low transmission rate.

- ## WPA-PSK

Based on pre-shared key, security mode WPA-PSK is characterized by high safety and simple configuration, which suits for common households and small business. WPA-PSK has two versions: WPA-PSK and WPA2-PSK.

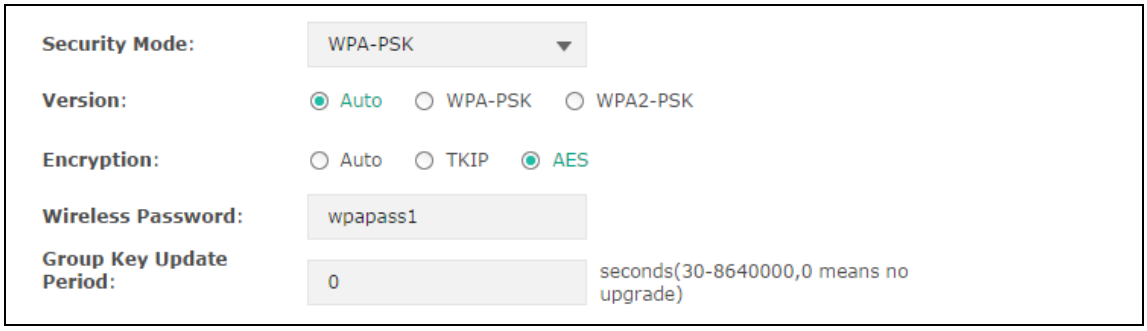


Figure 7-7 Security Mode_WPA-PSK

Version:	• **Auto**: Select WPA or WPA2 automatically based on the wireless station's capability and request. • **WPA**: Pre-shared key of WPA. • **WPA2**: Pre-shared key of WPA2.
Encryption:	Select the encryption type, including **Auto**, **TKIP**, and **AES**. The default setting is Auto, which can select TKIP (Temporal Key Integrity Protocol) or AES (Advanced Encryption Standard) automatically based on the wireless station's capability and request. AES is more secure than TKIP and TKIP is not supported in 802.11n mode. It is recommended to select AES as the encryption type.
Wireless Password:	Configure the WPA-PSK/WPA2-PSK password with ASCII or Hexadecimal characters. For ASCII, the length should be between 8 and 63 characters with combination of numbers, letters (case-sensitive) and common punctuations. For Hexadecimal, the length should be 64 characters (case-insensitive, 0-9, a-f, A-F).
Group Key Update Period:	Specify the group key update period in seconds. The value can be either 0 or at least 30. 0 means no update.

7.1.3 Wireless Advanced Settings

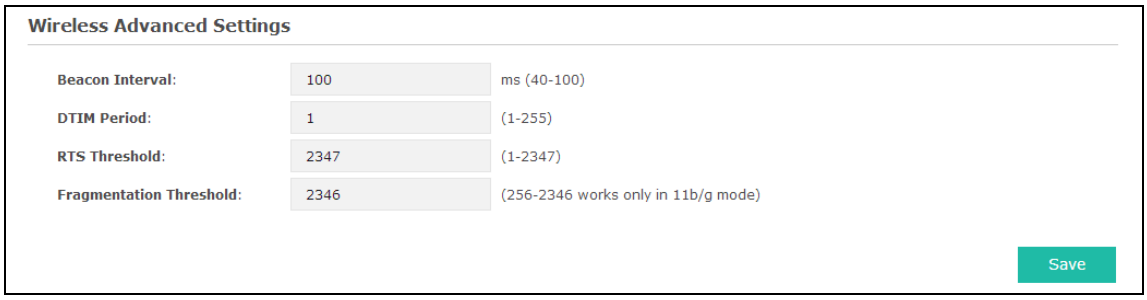


Figure 7-8 Wireless Advanced Settings

Beacon Interval:	Beacons are transmitted periodically by the device to announce the presence of a wireless network for the clients. Beacon Interval value determines the time interval of the beacons sent by the device. You can specify a value from 40 to 100. The default value is 100 milliseconds.
DTIM Period:	This value indicates the number of beacon intervals between successive Delivery Traffic Indication Messages (DTIMs) and this number is included in each Beacon frame. A DTIM is contained in Beacon frames to indicate whether the access point has buffered broadcast and/or multicast data for the client devices. Following a Beacon frame containing a DTIM, the access point will release the buffered broadcast and/or multicast data, if any exists. You can specify the value between 1-255 Beacon Intervals. The default value is 1, indicating the DTIM Period is the same as Beacon Interval. An excessive DTIM period may reduce the performance of multicast applications. It is recommended to keep it by default.
RTS Threshold:	When the RTS threshold is activated, all the stations and APs follow the Request to Send (RTS) protocol. When the station is to send packets, it will send a RTS to AP to inform the AP that it will send data. After receiving the RTS, the AP notices other stations in the same wireless network to delay their transmitting of data. At the same time, the AP inform the requesting station to send data. The value range is from 1 to 2347 bytes. The default value is 2347, which means that RTS is disabled.
Fragmentation Threshold:	Specify the fragmentation threshold for packets. If the size of the packet is larger than the fragmentation threshold, the packet will be fragmented into several packets. Too low fragmentation threshold may result in poor wireless performance caused by the excessive packets. The recommended and default value is 2346 bytes.

7.1.4 Load Balance

Figure 7-9 is only displayed in Standalone mode. Load Balance in Cluster mode is explained in 5.2 AP List.

By restricting the maximum number of clients accessing the EAPs, Load Balance helps to achieve rational use of network resources.

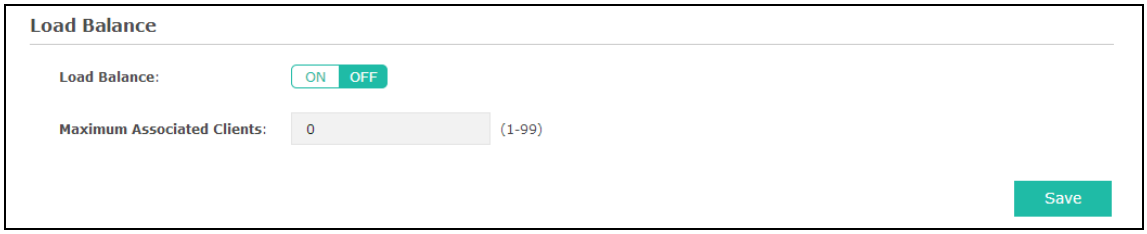


Figure 7-9 Load Balance

Load Balance:	Disable by default. Click **ON** to enable the function. After enabling it, you can set a number for maximum associated clients to control the wireless access.
Maximum Associated Clients:	Enter the number of clients to be allowed for connection to the EAP. The number ranges from 1 to 99.

7.2 Portal

Portal enhances the network security by providing authentication service to the clients who want to access the wireless local network. Portal is also called web authentication. The users have to log in a web page to establish verification.

Network resources can be classified into different types for different users. Part of them can be accessed for free by the clients; while some specific resources can only be accessed by authorized users. What's more, you can customize the authentication login page and specify a URL which the newly authenticated client will be redirected to. Please refer to Portal Configuration or Free Authentication Policy according to your need.

Following is the page of Portal.

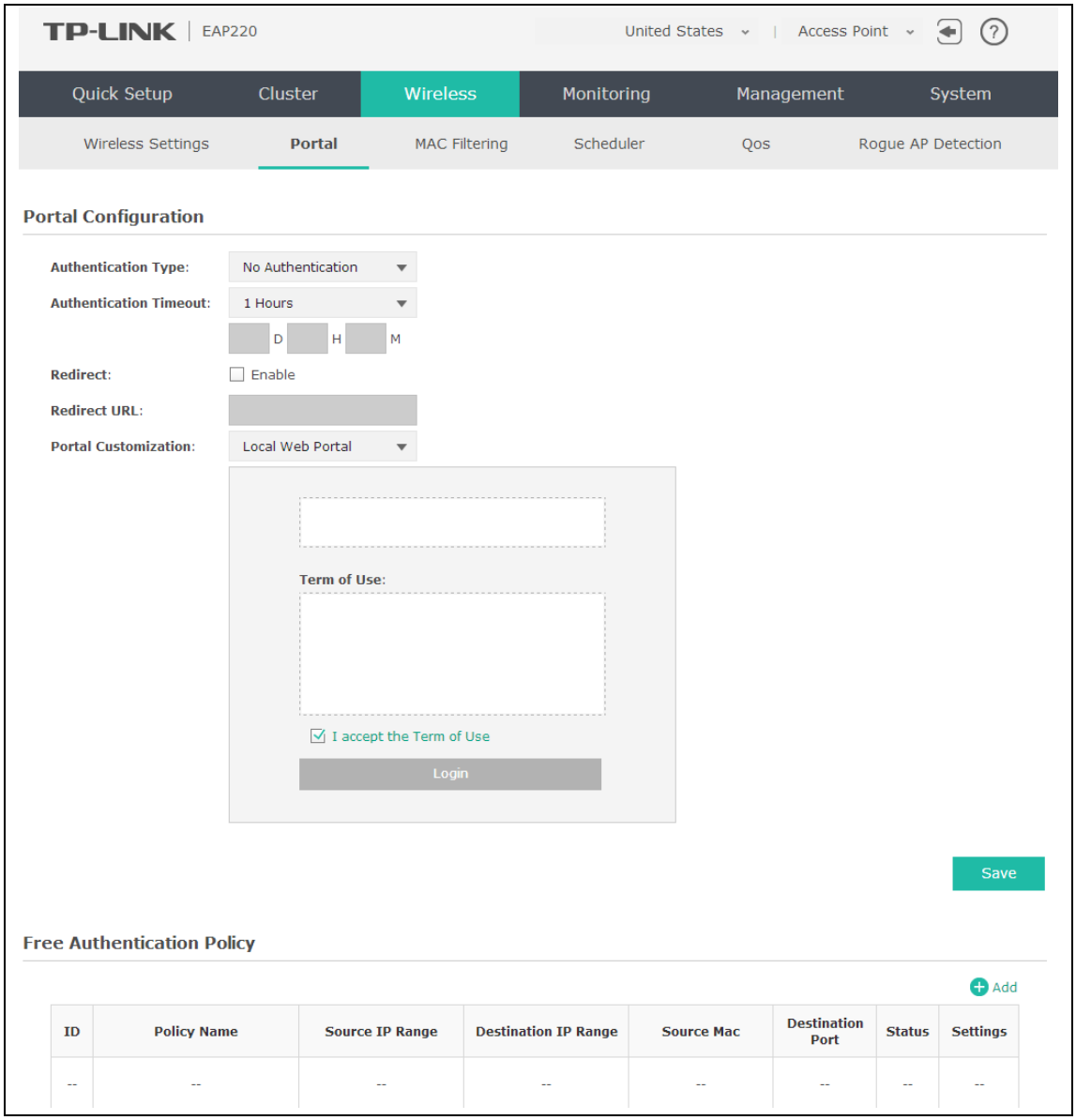


Figure 7-10 Portal Page

NOTE:

To apply Portal in a wireless network, please go to **Wireless→Wireless Settings→SSIDs** to enable Portal of a selected SSID.

7.2.1 Portal Configuration

Three authentication types are available: No Authentication, Local Password and External RADIUS Server.

1. No Authentication：Users are required to finish only two steps: agree with the user protocol and click the **Login** button.

2. Local Password：Users are required to enter the preset user name and password, which are saved in the EAP.
3. External RADIUS Server：Users are required to enter the preset user name and password, which are saved in the database of the RADIUS server. The RADIUS server acts as the authentication server, which allows you to set different user name and password for different users.

Refer to the following content to configure Portal based on actual network situations.

- ## No Authentication

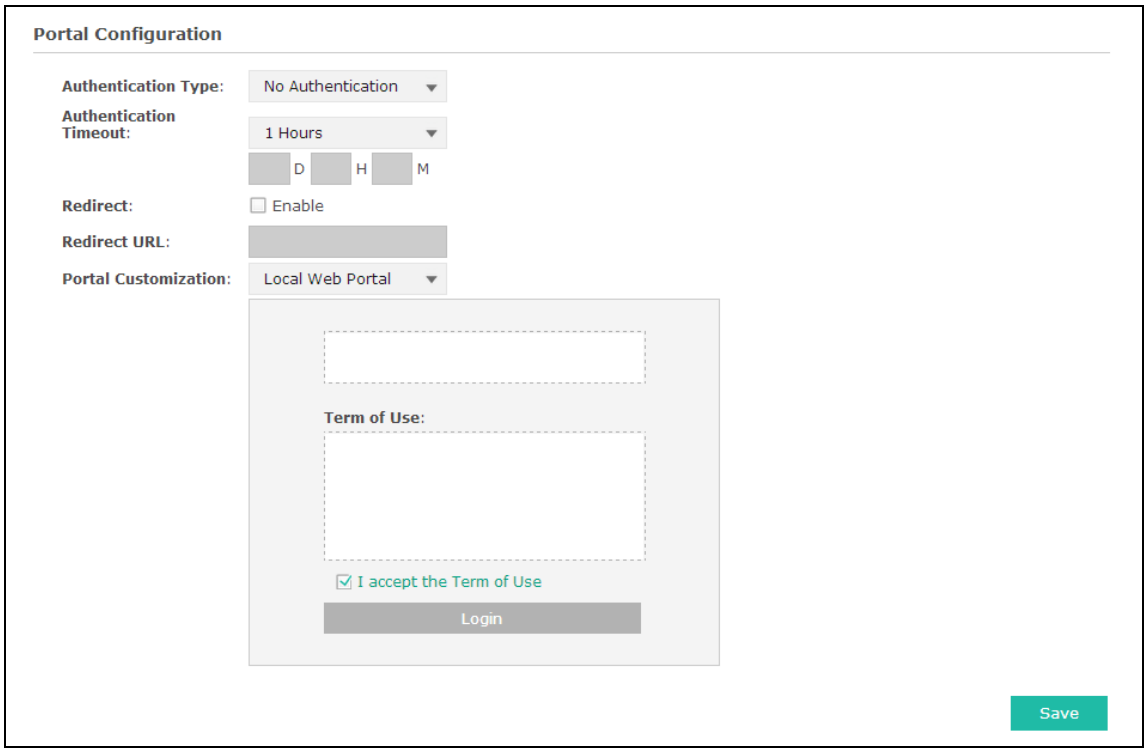
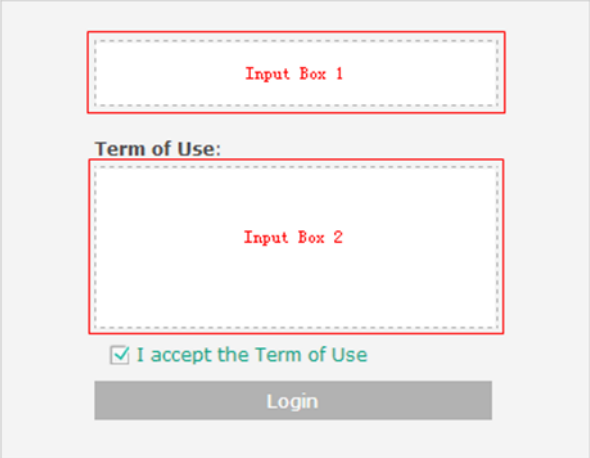


Figure 7-11 Portal Configuration_No Authentication

Authentication Type:	Select **No Authentication**.
Authentication Timeout:	After successful verification, an authentication session is established. Authentication Timeout decides the active time of the session. Within the active time, the device keeps the authentication session open with the associated client. To reopen the session, the client needs to log in the web authentication page and enter the user name and password again once authentication timeout is reached. By default, authentication timeout is one hour. Select **Custom** from the drop-down list to customize the parameter.
Redirect:	Disable by default. Redirect specifies that the portal should redirect the newly authenticated clients to the configured URL.

Redirect URL:	Enter the URL that a newly authenticated client will be directed to.
Portal Customization:	Select Local Web Portal, the authentication login page will be provided by the built-in portal server. The page configured below will be presented to users as the login page. Words can be filled in Input Box 1 and Input Box 2.  Enter up to 31 characters as the title of the authentication login page in Input Box 1, like "Guest Portal of TP-LINK". Enter the terms presented to users in Input Box 2. The terms can be 1 to 1023 characters long.

- **Local Password**

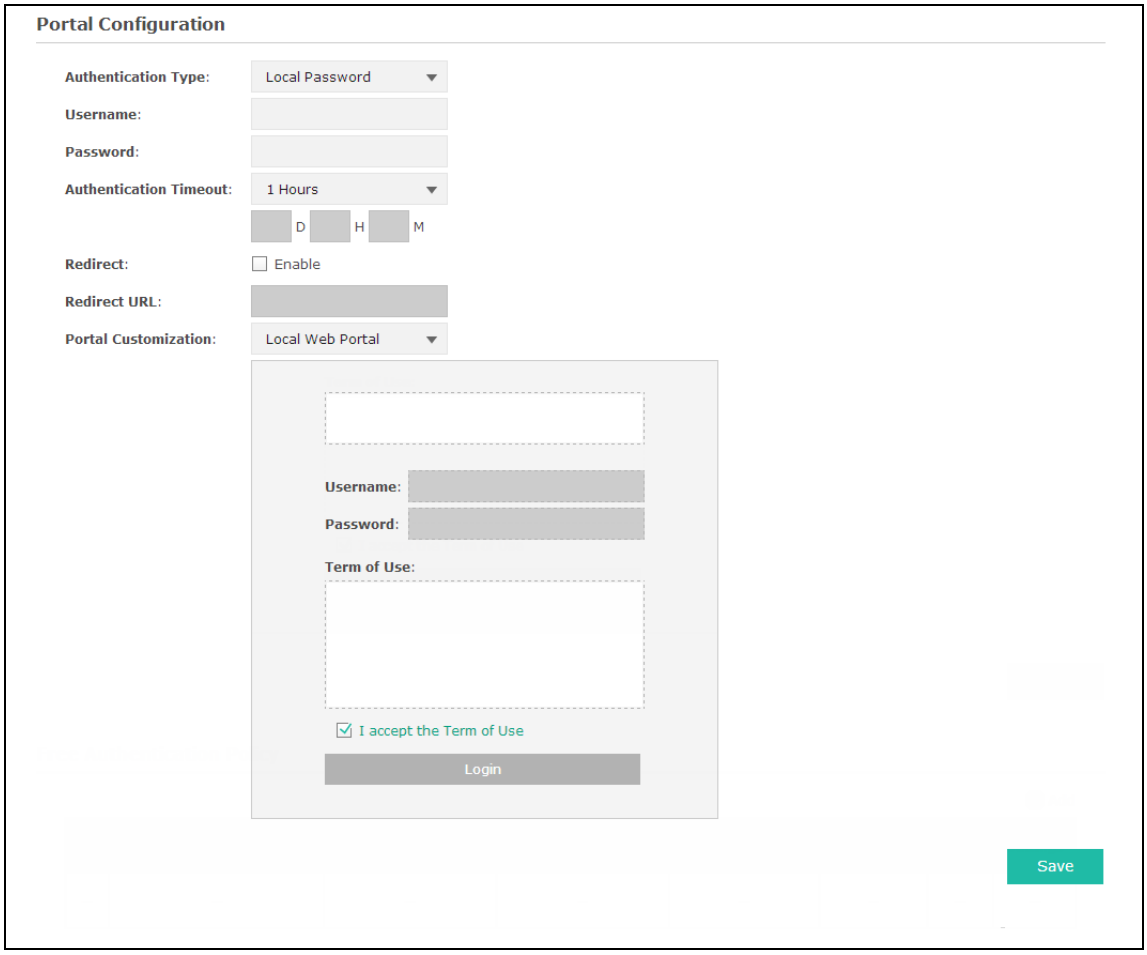
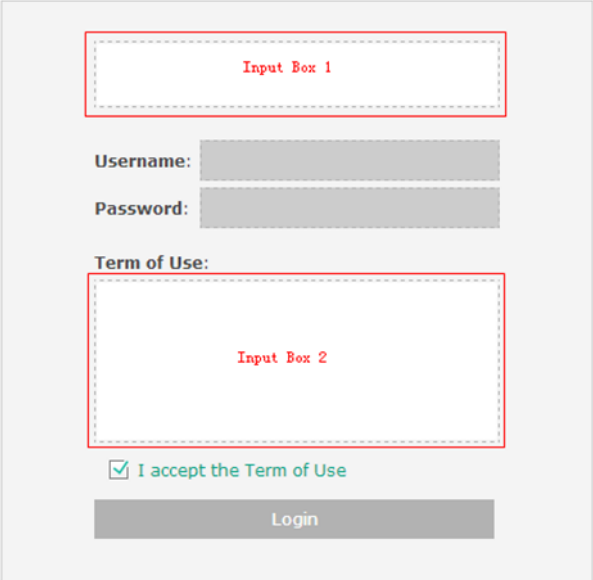


Figure 7-12 Portal Configuration_Local Password

Authentication Type:	Select **Local Password**.
Username:	Enter the user name for local authentication.
Password:	Enter the password for local authentication.
Authentication Timeout:	After successful verification, an authentication session is established. Authentication Timeout decides the active time of the session. Within active time, the device keeps the authentication session open with the associated client. To reopen the session, the client needs to log in the web authentication page and enter the user name and password again once authentication timeout is reached. By default, authentication timeout is one hour. Select **Custom** from the drop-down list to customize the parameter.
Redirect:	Disable by default. Redirect specifies that the portal should redirect the newly authenticated clients to the configured URL.

Redirect URL:	Enter the URL that a newly authenticated client will be directed to.
Portal Customization:	Select Local Web Portal, the authentication login page will be provided by the built-in portal server. The page below will be presented to users. Words can be filled in Input Box 1 and Input Box 2.  Enter up to 31 characters as the title of the authentication login page in Input Box 1, like "Guest Portal of TP-LINK". Enter the terms presented to users in Input Box 2. The terms can be 1 to 1023 characters long.

- ## External RADIUS Server

External RADIUS Server provides two types of portal customization: Local Web Portal and External Web Portal. The authentication login page of Local Web Portal is provided by the built-in portal server of the EAP, as Figure 7-13 shown. The authentication login page of External Web Portal is provided by external portal server, as Figure 7-14 shown.

1. Local Web Portal

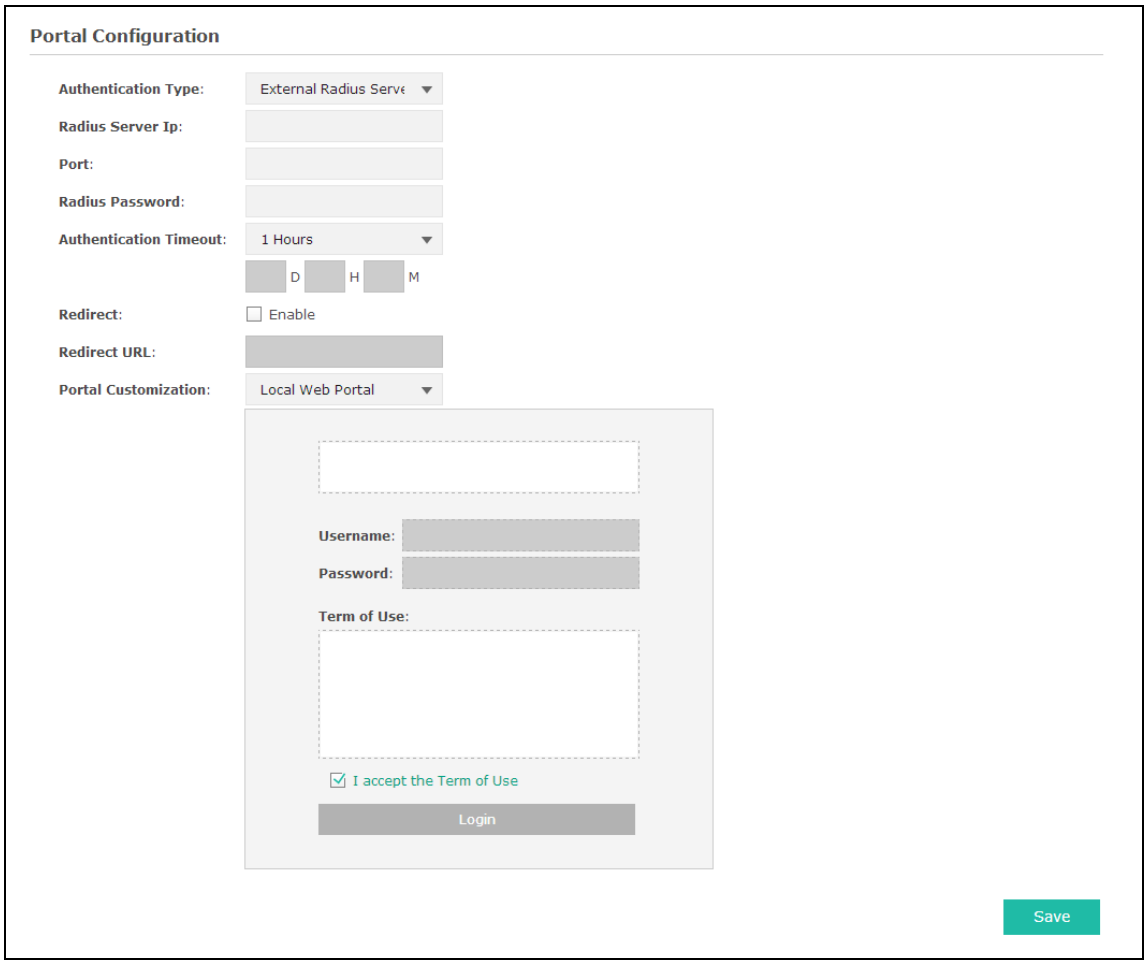
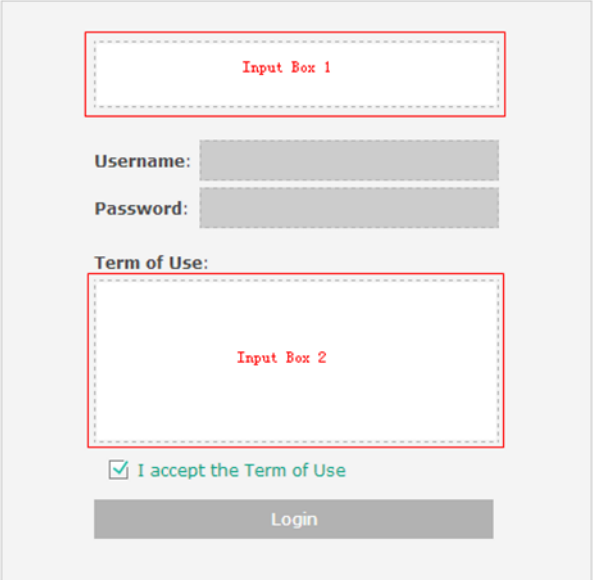


Figure 7-13 Portal Configuration_External RADIUS Server_Local Web Portal

Authentication Type:	Select **External RADIUS Server**.
RADIUS Server IP:	Enter the IP address of the RADIUS server.
Port:	Enter the port for authentication service.
RADIUS Password:	Enter the password to log in to the RADIUS server.
Authentication Timeout:	After successful verification, an authentication session is established. Authentication Timeout decides the active time of the session. Within active time, the device keeps the authentication session open with the associated client. To reopen the session, the client needs to log in to the web authentication page and enter the user name and password again once authentication timeout is reached. By default, authentication timeout is one hour. Select **Custom** from the drop-down list to customize the parameter.
Redirect:	Disable by default. Redirect specifies that the portal should redirect the newly authenticated clients to the configured URL.

Redirect URL:	Enter the URL that a newly authenticated client will be directed to.
Portal Customization:	Select Local Web Portal, the authentication login page will be provided by the built-in portal server. The page below will be presented to users. Words can be filled in Input Box 1 and Input Box 2.  Enter up to 31 characters as the title of the authentication login page in Input Box 1, like "Guest Portal of TP-LINK". Enter the terms presented to users in Input Box 2. The terms can be 1 to 1023 characters long.

2. External Web Portal

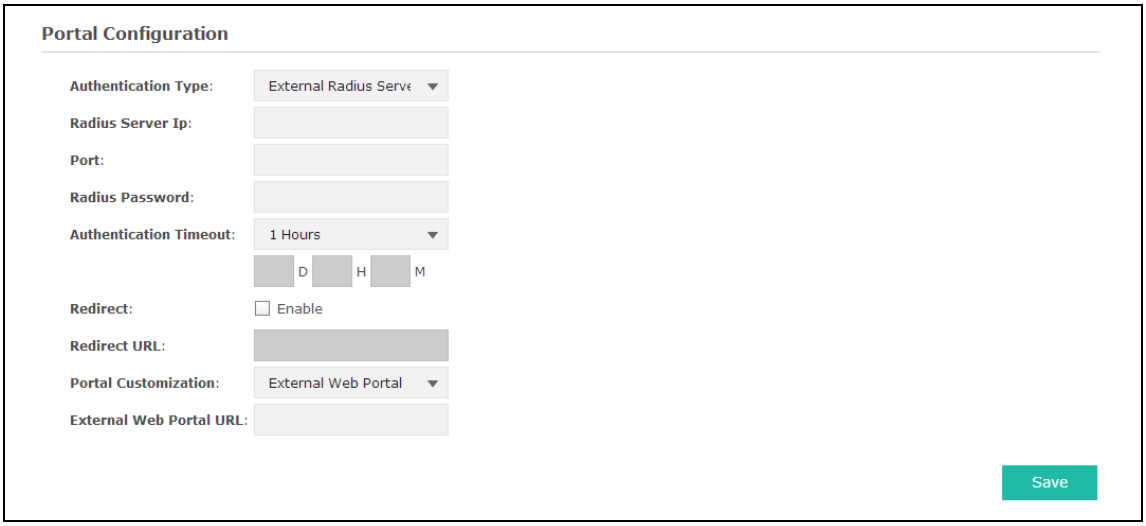


Figure 7-14 Portal Configuration_External RADIUS Server_External Web Portal

Authentication Type:	Select **External RADIUS Server**.
RADIUS Server IP:	Enter the IP address of the RADIUS server.
Port:	Enter the port for authentication service.
RADIUS Password:	Enter the password to log in to the RADIUS server.
Authentication Timeout:	After successful verification, an authentication session is established. Authentication Timeout decides the active time of the session. Within active time, the device keeps the authentication session open with the associated client. To reopen the session, the client needs to log in the web authentication page and enter the user name and password again once authentication timeout is reached. By default, authentication timeout is one hour. Select **Custom** from the drop-down list to customize the parameter.
Redirect:	Disable by default. Redirect specifies that the portal should redirect the newly authenticated clients to the configured URL.
Redirect URL:	Enter the URL that a newly authenticated client will be directed to.
Portal Customization:	Select **External Web Portal**.
External Web Portal URL:	Enter the authentication login page's URL, which is provided by the remote portal server.

7.2.2 Free Authentication Policy

Free Authentication Policy allows clients to access network resources for free. On the lower part of the Portal page you can configure and view free authentication policies.

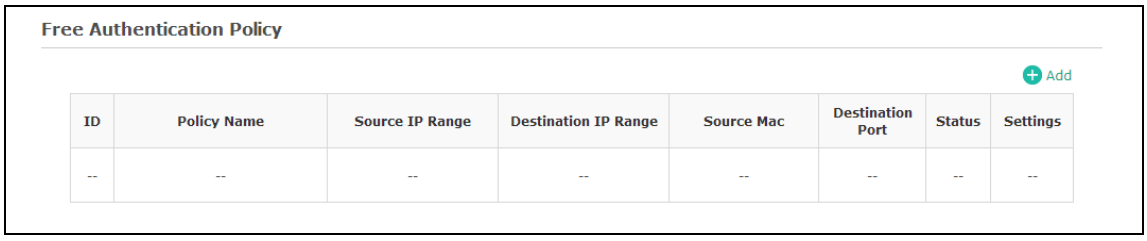


Figure 7-15 Free Authentication Policy

Click Add to add a new authentication policy and configure its parameters.

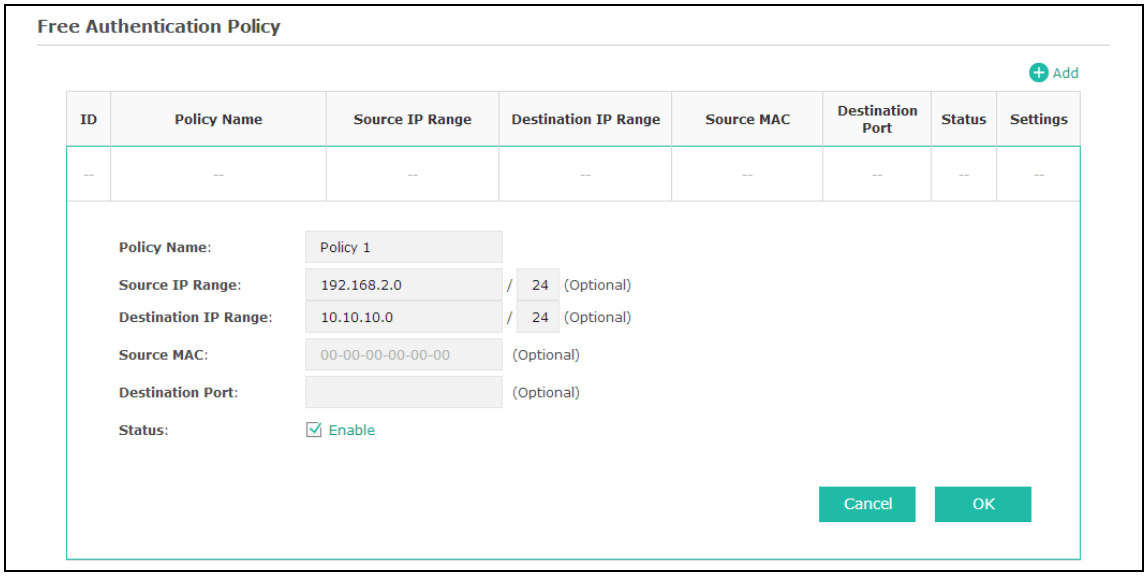


Figure 7-16 Configure Free Authentication Policy

Policy Name:	Enter a policy name.
Source IP Range:	Enter the source IP address and subnet mask of the clients who can enjoy the free authentication policy. Leaving the field empty means all IP addresses can access the specific resources.
Destination IP Range:	Enter the destination IP address and subnet mask for free authentication policy. Leaving the field empty means all IP addresses can be visited.
Source MAC:	Enter the source MAC address of the clients who can enjoy the free authentication policy. Leaving the field empty means all MAC addresses can access the specific resources.
Destination Port:	Enter the destination port for free authentication policy. Leaving the field empty means all ports can be accessed.
Status:	Check the box to enable the policy.

Click the button **OK** in Figure 7-16 and the policy is successfully added as Figure 7-17 shows.

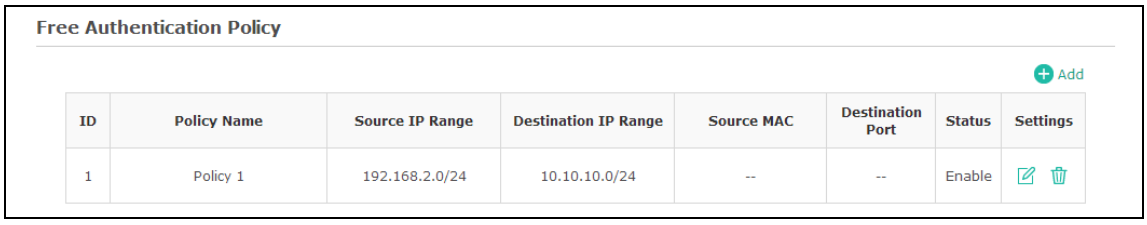


Figure 7-17 Add Free Authentication Policy

Here is the explanation of Figure 7-17: The policy name is Policy 1. Clients with IP address range 192.168.2.0/24 are able to visit IP range 10.10.10.0/24. Policy 1 is enabled.

Click to edit the policy. Click to delete the policy.

7.3 MAC Filtering

MAC Filtering uses MAC addresses to determine whether one host can access the wireless network or not. Thereby it can effectively control the user access in the wireless network.

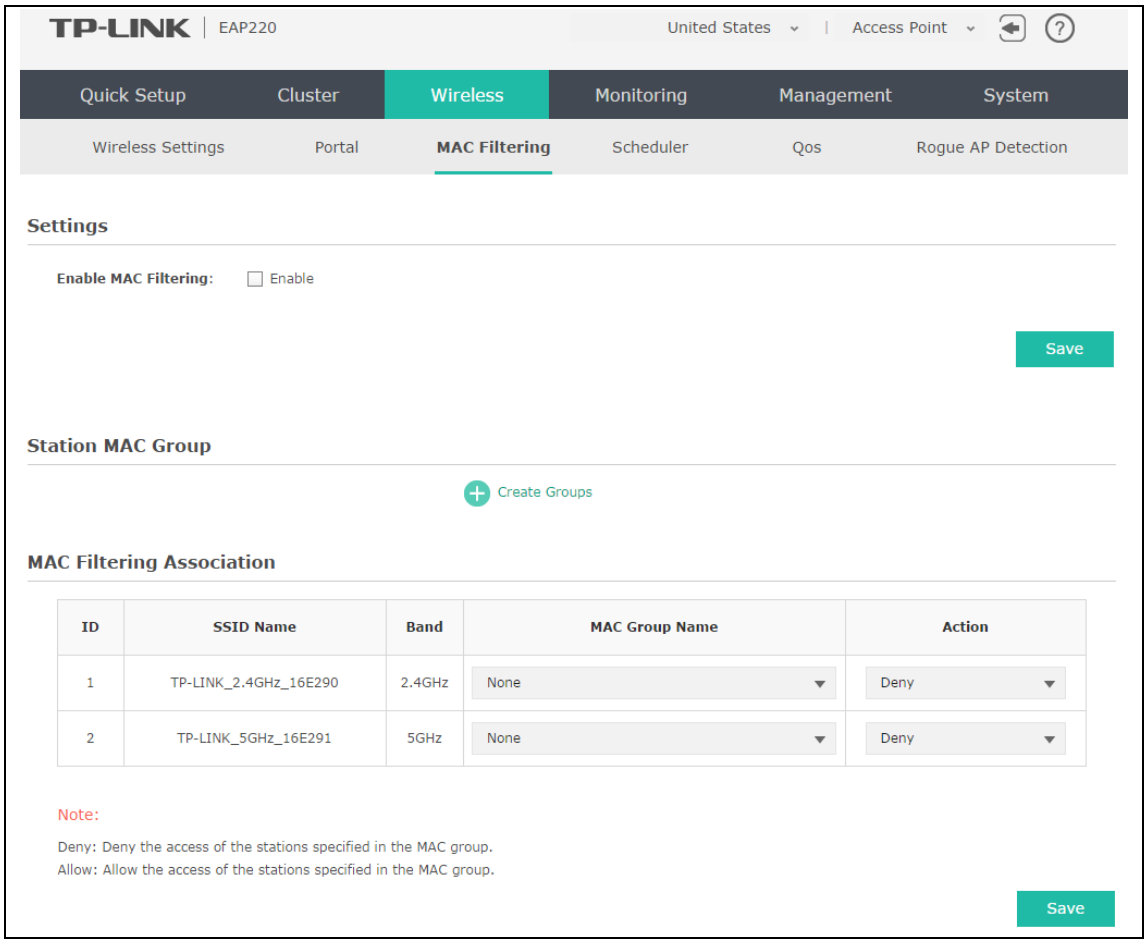


Figure 7-18 MAC Filtering Page

- **Settings**

Enable MAC Filtering: Check the box to enable MAC Filtering.

- **Station MAC Group**

Follow the steps below to add MAC groups.

Step 1:

Click Create Groups, two tables will be shown.

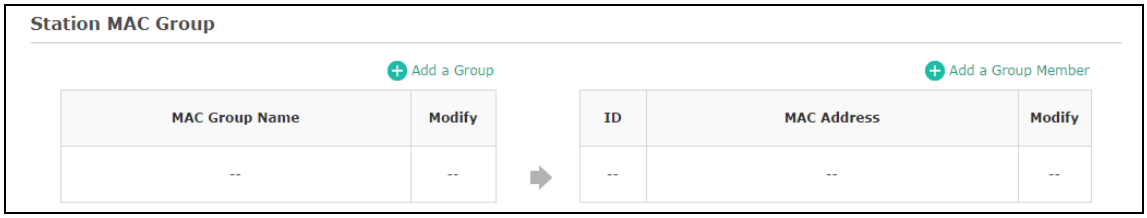


Figure 7-19 Station MAC Group

Step 2:

Click Add a Group and fill in a name for the MAC group.

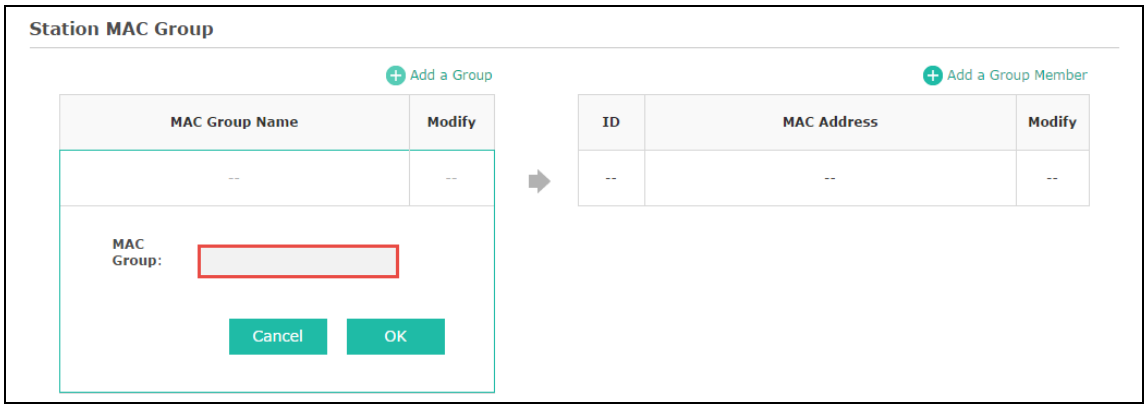


Figure 7-20 Add a Group

Step 3:

Click Add a Group Member and input the MAC address you want to organize into this group.

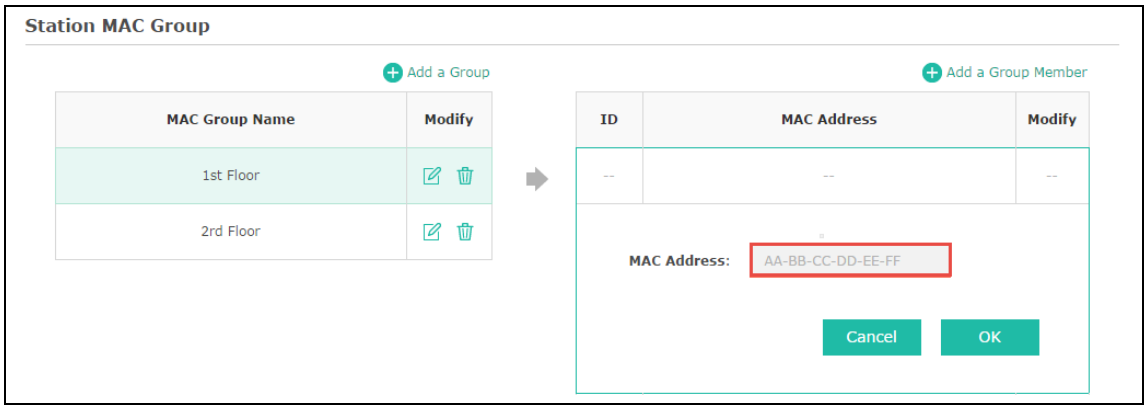


Figure 7-21 Add a Group Member

Click in Modify column to edit the MAC group name or MAC address. Click to delete the MAC group or group member.

- **MAC Filtering Association**

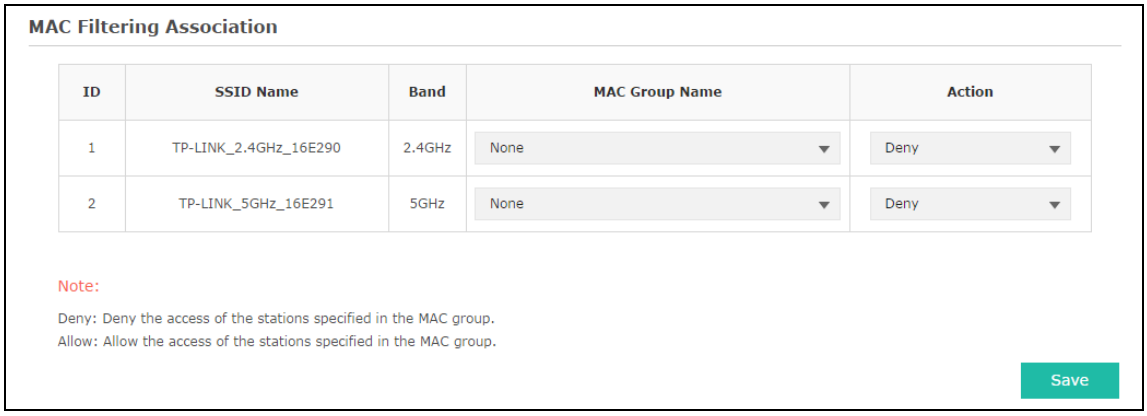


Figure 7-22 MAC Filtering Association

SSID Name:	Displays the SSID of the wireless network.
Band:	Displays the frequency band the wireless network operates at.
MAC Group Name:	Select a MAC group from the drop-down list to allow or deny its members to access the wireless network.
Action:	• **Allow**: Allow the access of the stations specified in the MAC group. • **Deny**: Deny the access of the stations specified in the MAC group.

7.4 Scheduler

Scheduler allows you to configure rules with specific time interval for radios to operate, which automates the enabling or disabling of the radio.

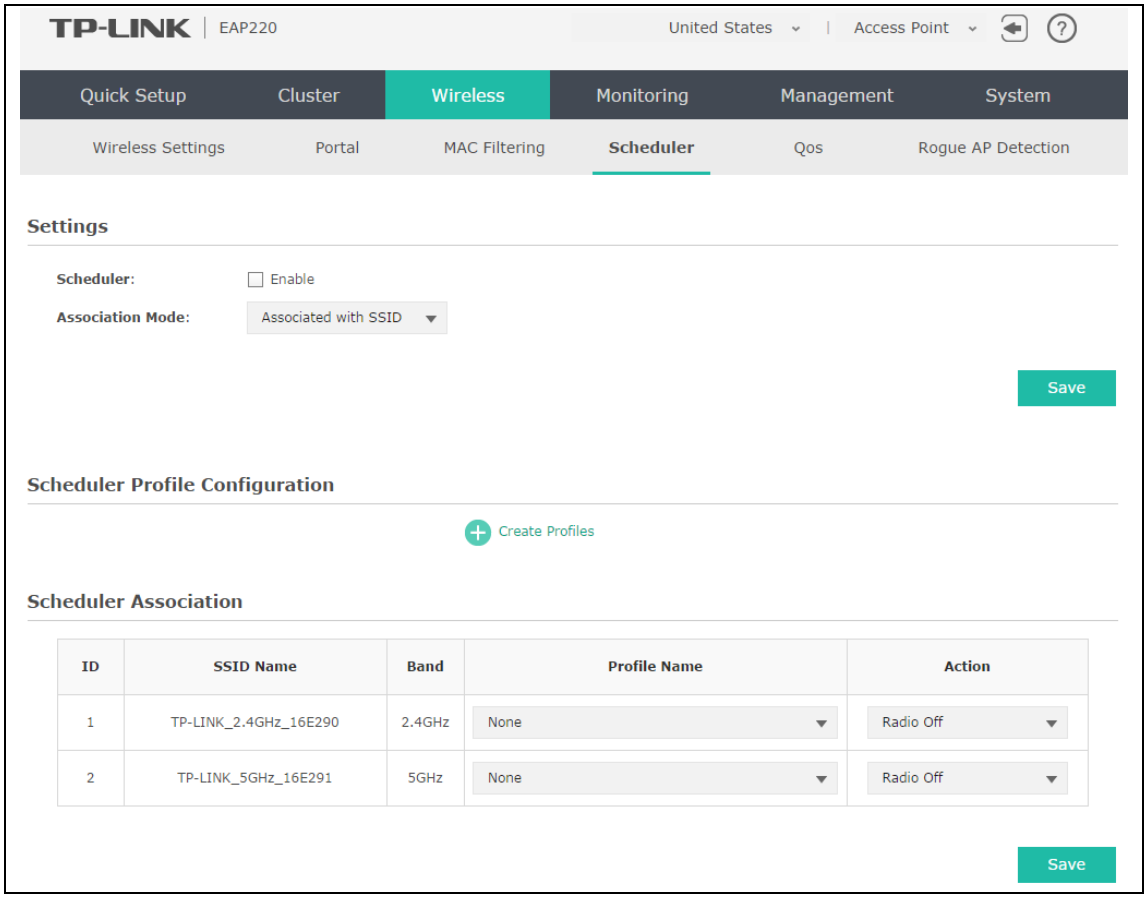


Figure 7-23 Scheduler Page

- ## Settings

Scheduler:	Check the box to enable Scheduler.
Association Mode:	Select **Associated with SSID/AP**, you can perform configurations on the SSIDs/APs. The display of Scheduler Association is based on your option here.

- ## Scheduler Profile Configuration

Follow the steps below to add rules.

Step 1:

Click Create Profiles, two tables will be shown.

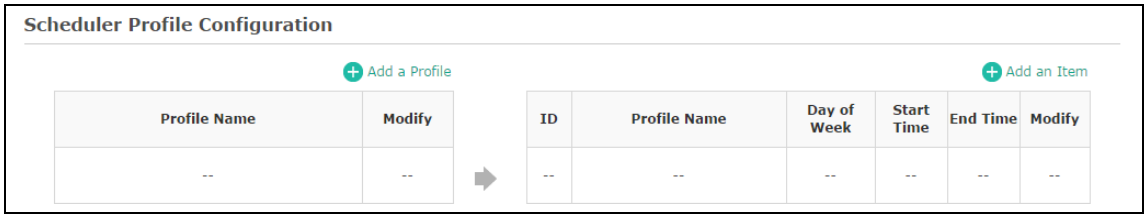


Figure 7-24 Scheduler Profile Configuration

Step 2:

Click Add a Profile and input a profile name for the rule.

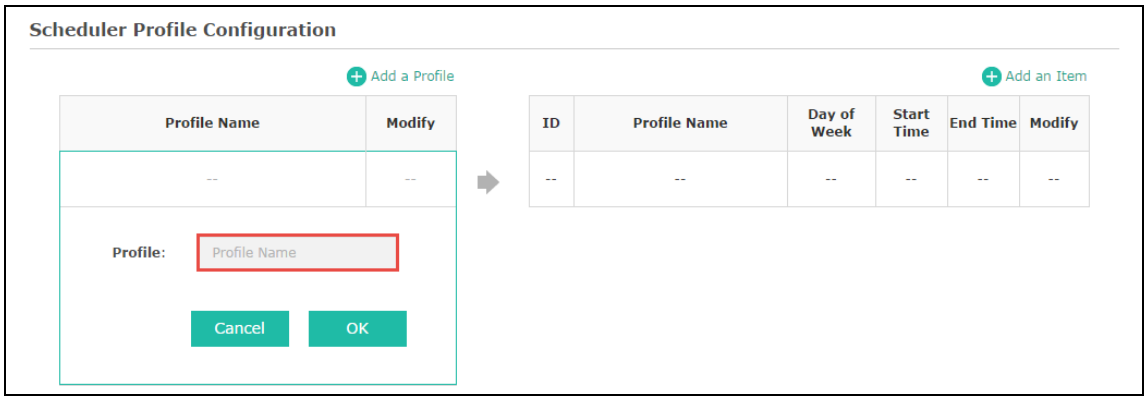


Figure 7-25 Add a Profile

Step 3:

Click Add a Item and configure the recurring schedule for the rule.

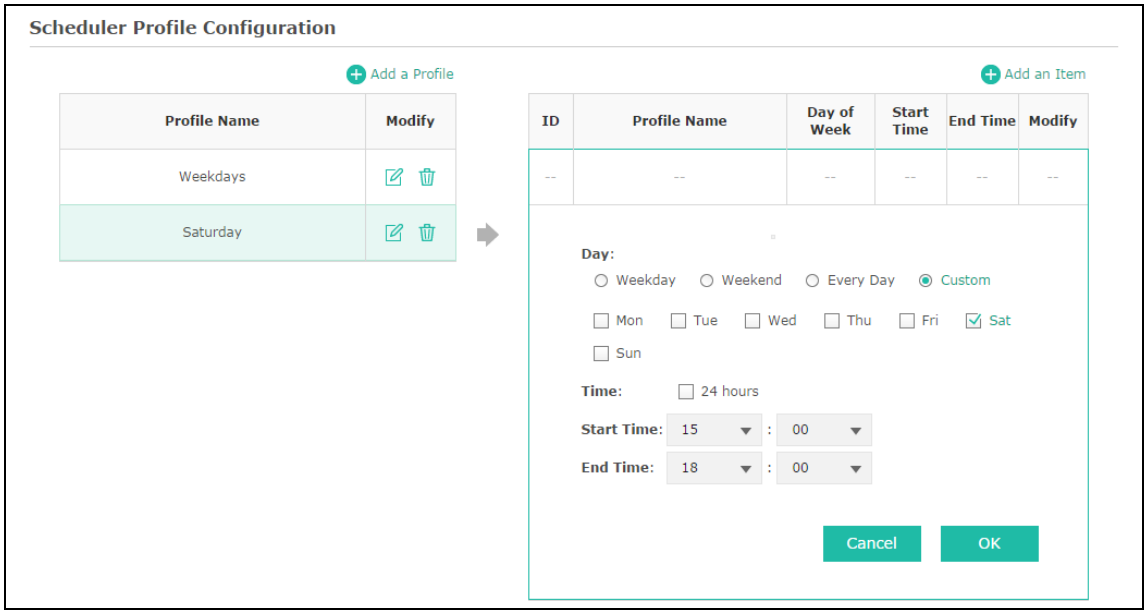


Figure 7-26 Add a Rule

- ## Scheduler Association

This zone will display different contents based on your selection of association mode in Settings.

1. Associated with SSID

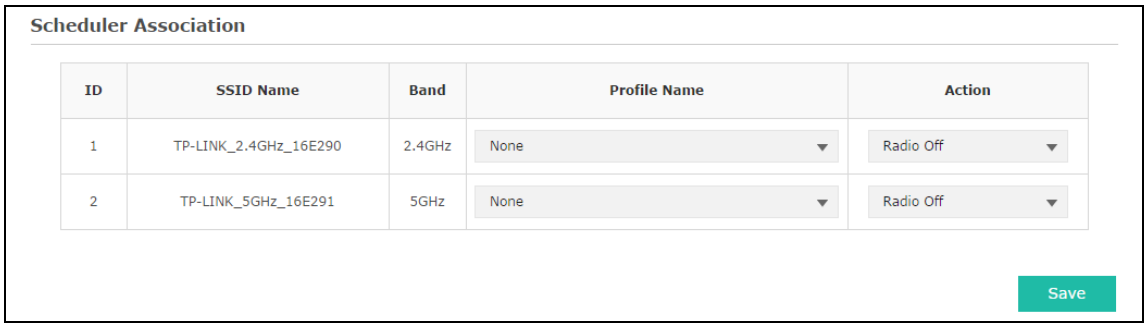


Figure 7-27 Scheduler Association_Associated with SSID

SSID Name:	Displays the SSID of an individual device or a cluster.
Band:	Displays the frequency band which the wireless network operates at.
Profile Name:	Select a profile name from the drop-down list. Profile name is configured in Scheduler Profile Configuration.
Action:	Select **Radio On/Off** to turn on/off the wireless network during the time interval set for the profile.

2. Associated with AP

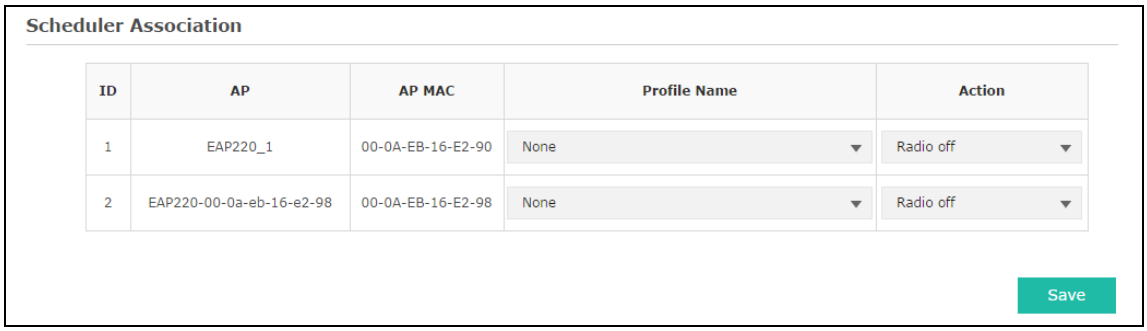


Figure 7-28 Scheduler Association_Associated with AP

AP:	Displays the name of the device. If you want to customize the device name, please refer to 5.2 AP List Device Name.
AP MAC:	Displays the MAC address of the device.
Profile Name:	Select a profile name from the drop-down list. Profile name is configured in Scheduler Profile Configuration.
Action:	Select **Radio On/Off** to turn on/off the wireless network during the time interval set for the profile.

7.5 QoS

The EAP supports Quality of Service (QoS) to prioritize voice and video traffic over other traffic types.

In normal use, the default values for the EAP device and station EDCA should not need to be changed. Changing these values affects the QoS provided.

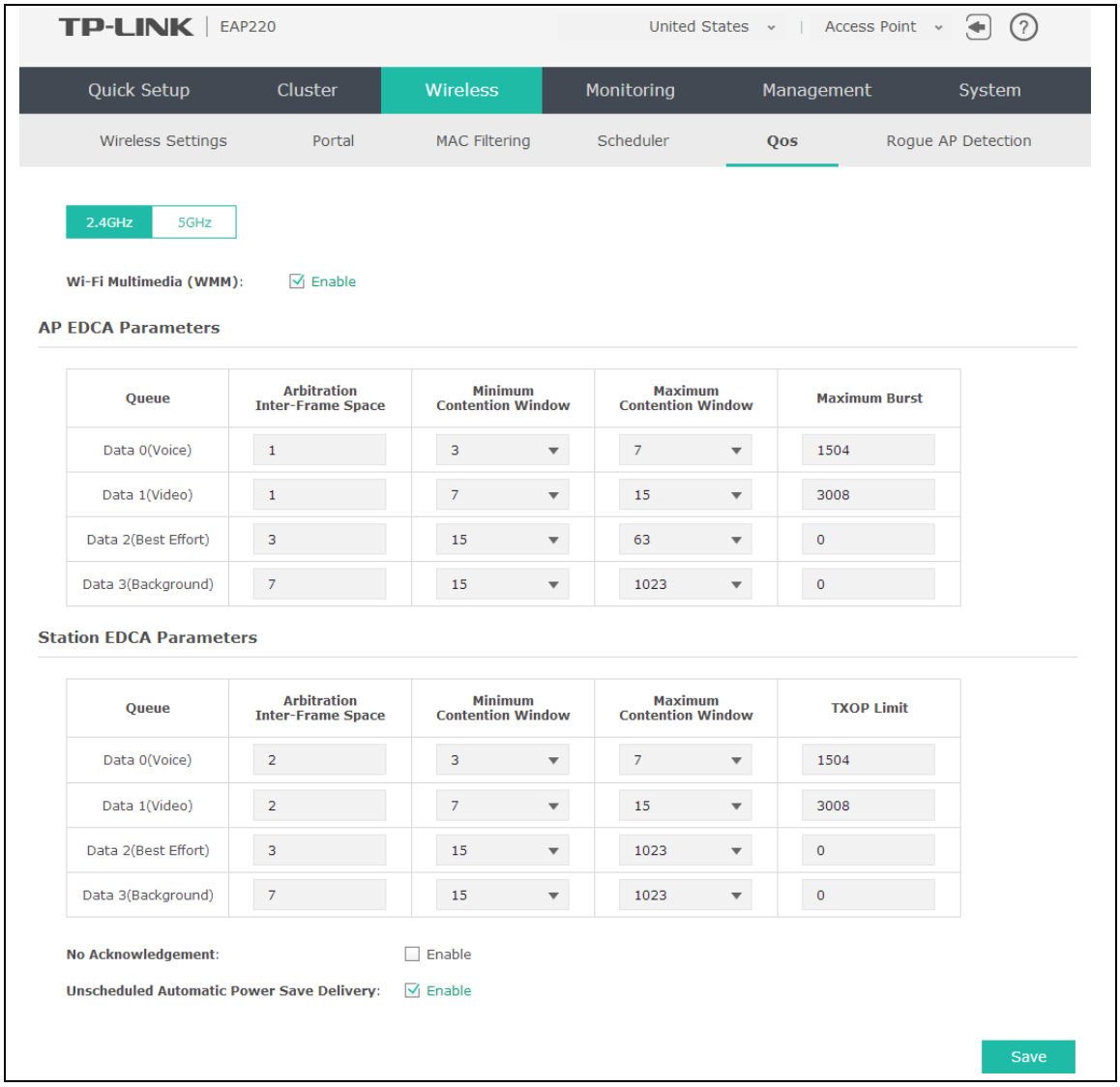


Figure 7-29 QoS Page

2.4GHz/5GHz:	Select a frequency band.
Wi-Fi Multimedia (WMM):	By default, WMM is enabled. After WMM is enabled, the device has the QoS function to guarantee the transmission of audio and video packets with high priority.

7.5.1 AP EDCA Parameters

AP Enhanced Distributed Channel Access (EDCA) parameters affect traffic flowing from the EAP device to the client station.

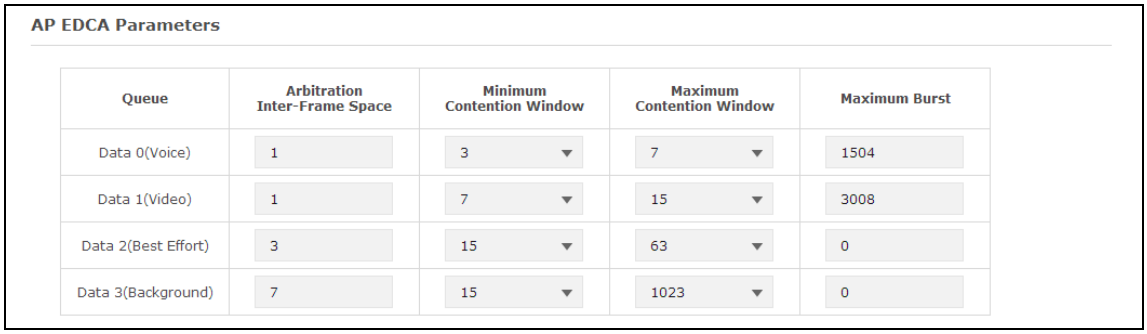


Figure 7-30 AP EDCA Parameters

Queue:	Displays the transmission queues: Data 0>Data 1>Data 2>Data 3.
Arbitration Inter-Frame Space:	A wait time for data frames. The wait time is measured in slots. Valid values for AIFS are from 1 to 15.
Minimum Contention Window:	An input to the algorithm that determines the initial random backoff wait time (window) for retry of a transmission.
Maximum Contention Window:	The upper limit (in milliseconds) for the doubling of the random backoff value.
Maximum Burst	This parameter applies only to traffic flowing from EAP to the client station. This value specifies (in milliseconds) the maximum burst length allowed for packet bursts on the wireless network. A packet burst is a collection of multiple frames transmitted without header information. The decreased overhead results in higher throughput and better performance. Valid values for Maximum Burst are from 0 to 8192 and should be exactly divided by 32.

7.5.2 Station EDCA Parameters

Station EDCA parameters affect traffic flowing from the client station to the EAP device.

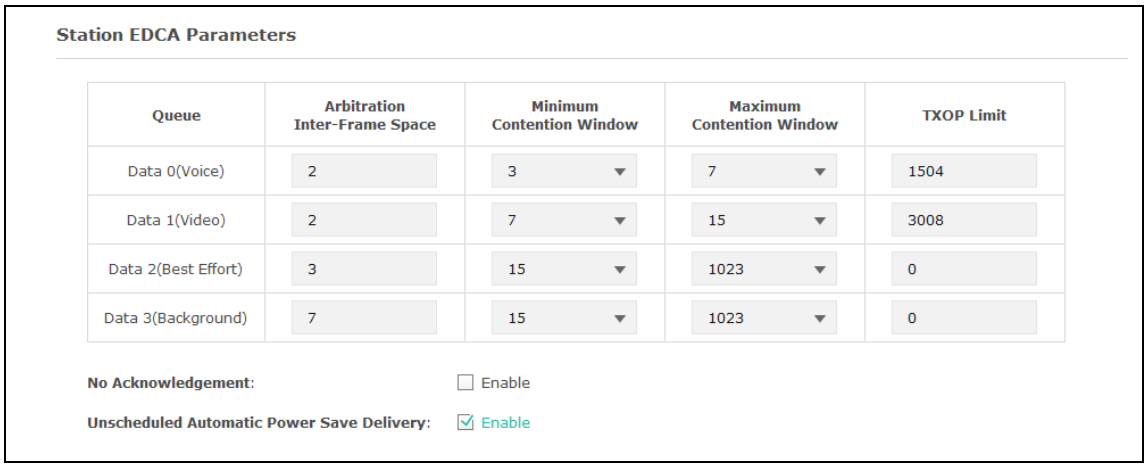


Figure 7-31 Station EDCA Parameters

Queue:	Displays the transmission queues: Data 0>Data 1>Data 2>Data 3.
Arbitration Inter-Frame Space:	A wait time for data frames. The wait time is measured in slots. Valid values for AIFS are 1 through 15.
Minimum Contention Window:	An input to the algorithm that determines the initial random backoff wait time (window) for retry of a transmission.
Maximum Contention Window:	The upper limit (in milliseconds) for the doubling of the random backoff value.
TXOP Limit:	The Transmission Opportunity (TXOP) is an interval of time, in milliseconds, when a WME client station has the right to initiate transmissions onto the wireless medium towards the EAP device. Valid values for TXOP Limit are from 0 to 8192 and should be exactly divided by 32.
No Acknowledgement:	Select **Enable** to specify that the EAP device should not acknowledge frames with QosNoAck as the service class value. By default, it is disabled.
Unscheduled Automatic Power Save Delivery:	Select **Enable** to enable APSD, which is a power management method. APSD is recommended if VoIP phones access the network through the EAP device. By default, it is enabled.

7.6 Rogue AP Detection

A Rogue AP is an access point that has been installed on a secure network without explicit authorization from a system administrator.

The EAP device can scan all channels to detect all APs in the vicinity of the network. If rogue APs are detected, they are shown on the Detected Rogue AP List. If an AP listed as a rogue is legitimate, you can add it to the Trusted AP List.

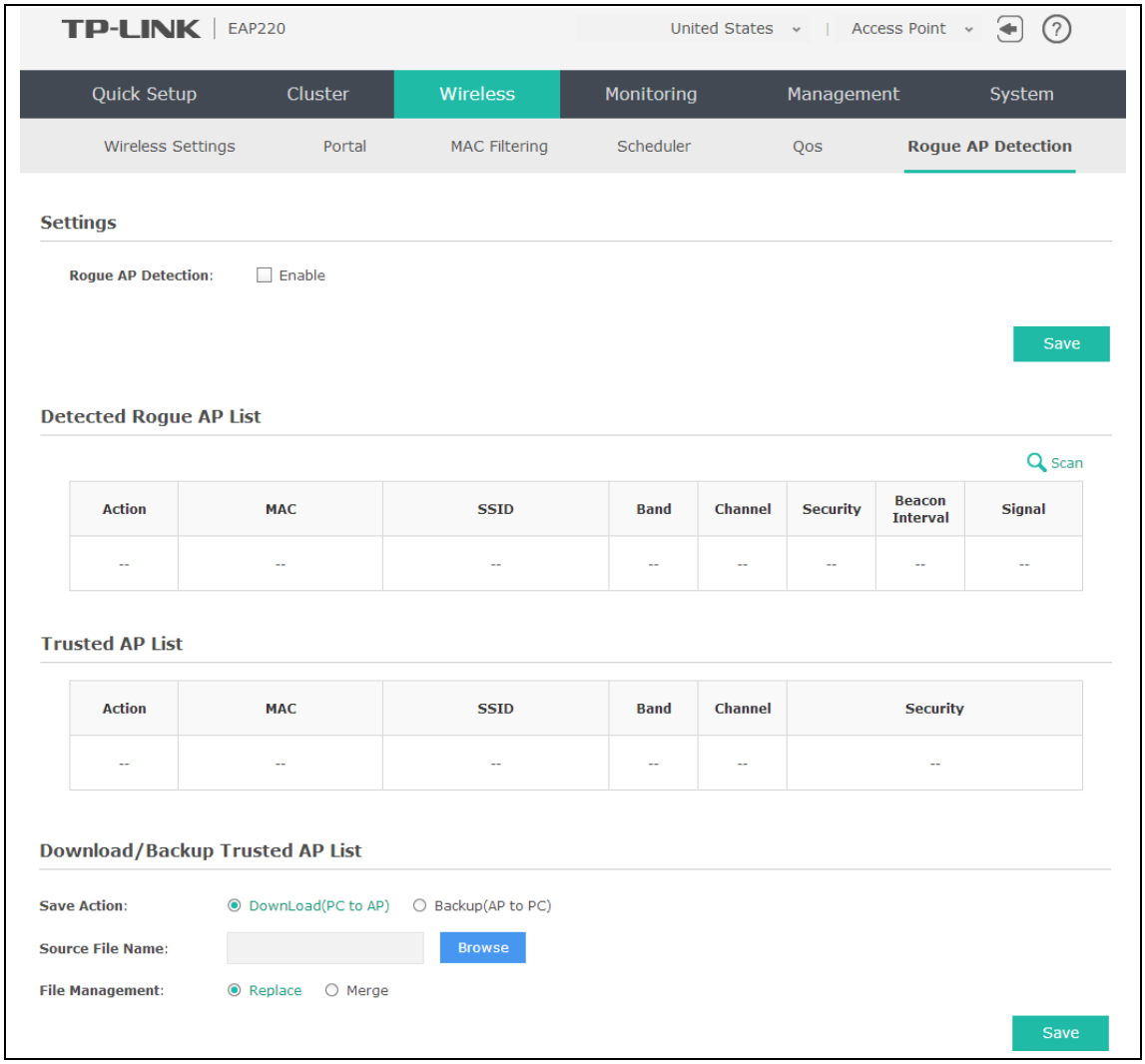


Figure 7-32 Rogue AP Detection Page

7.6.1 Settings

Figure 7-33 Enable Rogue AP Detection

Rogue AP Detection: Check the box to enable Rogue AP Detection, then click **Save**.

7.6.2 Detected Rogue AP List

Information about the detected rogue APs is displayed in the list. By default, the status of the detected rogue AP is unknown. You can click **Known** in Action column to move the AP to the Trusted AP List.

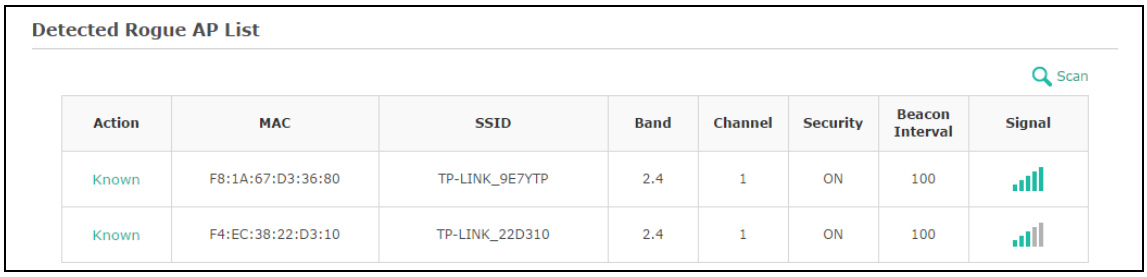


Figure 7-34 Detected Rogue AP List

Scan	Click to scan rogue APs. Make sure you have enabled Rogue AP Detection and saved the setting before you click the button.
Action:	Click **Known** to move the AP to the Trusted AP List. After the configurations are saved, the moved AP will not be displayed in the Detected Rogue AP List.
MAC:	The MAC address of the rogue AP.
SSID:	The SSID for the rogue AP.
Band:	Displays the frequency band which the wireless network of the rogue AP operates at.
Channel:	The channel on which the rogue AP is currently broadcasting.
Security:	Displays the enabling or disabling of the security mode of the wireless network.
Beacon Interval:	The beacon interval used by the rogue AP. Beacon frames are transmitted by an AP at regular intervals to announce the existence of the wireless network. The default behavior is to send a beacon frame once every 100 milliseconds (or 10 per second).
Signal:	The strength of the radio signal emitting from the rogue AP.

7.6.3 Trusted AP List

Information about the trusted APs is displayed in the list.

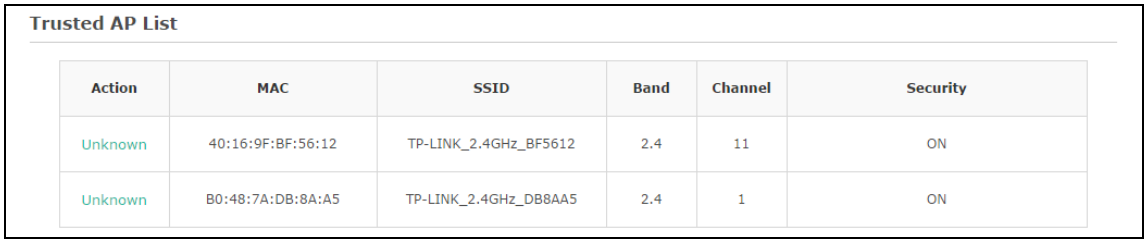


Figure 7-35 Trusted AP List

Action:	Click **Unknown** to move the AP out of the Trusted AP List.
MAC:	The MAC address of the trusted AP.
SSID:	The SSID for the trusted AP.
Band:	Displays the frequency band which the wireless network of the trusted AP operates at.
Channel:	The channel on which the trusted AP is currently broadcasting.
Security:	Displays the enabling or disabling of the security mode of the wireless network.

7.6.4 Download/Backup Trusted AP List

You can import a list of trusted APs from a saved list which is acquired from another AP or created from a text file. The AP whose MAC address is in the Trusted AP List will not be detected as a rogue.

You can also backup a list and save it in your PC.

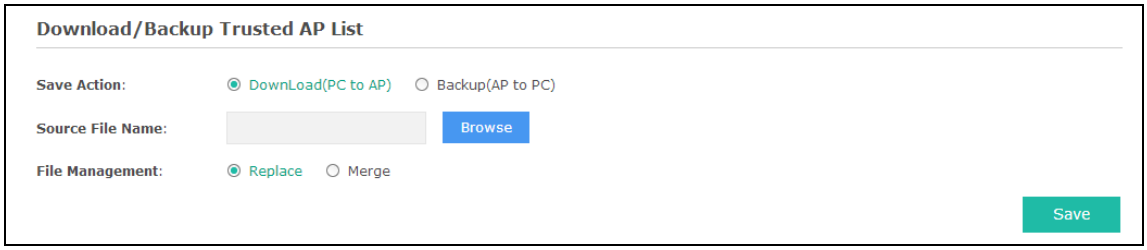


Figure 7-36 Download/Backup Trusted AP List

Save Action:	Select **Download (PC to AP)** to import a trusted AP list to the device. Select **Backup (AP to PC)** to copy the trusted AP list to your PC.
Source File Name:	Click **Browse** and choose the path of a saved trusted AP list or to save a trusted AP list.
File Management:	Select **Replace** to import the list and replace the contents of the Trusted AP List. Select **Merge** to import the list and add the APs in the imported file to the APs currently shown in the Trusted AP List

NOTE:

EAP device does not have any control over the APs in the Detected Rogue AP List.

Chapter 8 Monitoring

On Monitoring page, you can monitor the network running status and statistics based on APs, SSIDs and Clients.

8.1 AP

AP List on the Monitoring page displays the numbers of EAP devices in a cluster, the MAC address of the EAPs, the number of clients or the corresponding parameters of a standalone AP. Select an AP in the AP List, below which the AP's detailed information will be shown, including Device Information, Wireless Settings, LAN Information, Client, LAN Traffic and Radio Traffic.

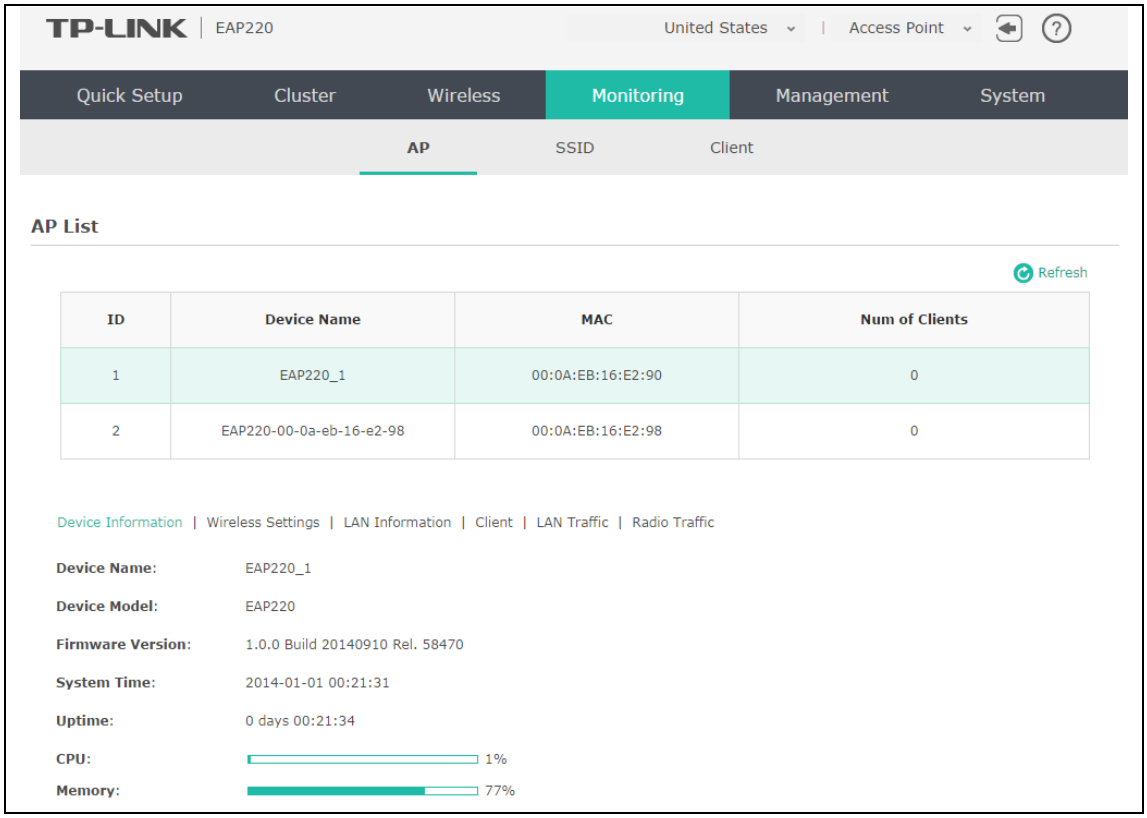


Figure 8-1 AP Monitoring

8.1.1 AP List

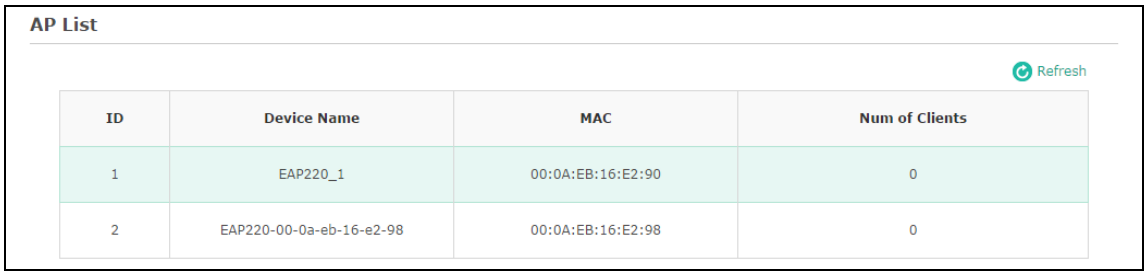


Figure 8-2 AP List

Device Name:	Displays the device name. If you want to customize the device name, please refer to 5.2 AP List Device Name.
MAC:	Displays the MAC address of the EAP.
Num of Clients:	Displays the number of clients connected to the EAP.

- **Device Information**

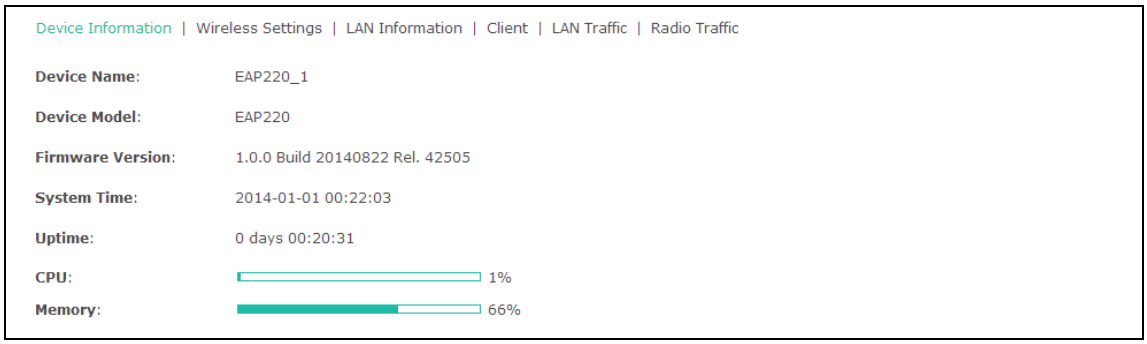


Figure 8-3 Device Information

Device Name:	Displays the device name. If you want to customize the device name, please refer to 5.2 AP List Device Name.
Device Model:	Displays the model of the device.
Firmware Version:	Displays the firmware version of the device. If you want to upgrade the firmware, please refer to 10.5 Firmware Upgrade.
System Time:	Displays the system time of the device. If you want to adjust the system time, please refer to 10.2.1 Time Settings.
Uptime:	Displays the time that has elapsed since the last reboot.
CPU:	Displays the CPU occupancy rate, which helps you to preliminarily judge whether the device functions properly.

Memory:	Displays the memory usage rate, which helps you to preliminarily judge whether the device functions properly.

- ## Wireless Settings

Figure 8-4 Wireless Settings

2.4GHz/5GHz:	Select a frequency band.
Region:	Displays the region you've selected.
Channel/Frequency:	Displays the channel number and the operating frequency. If you want to change them, please refer to 5.2 AP List Radio in Cluster mode, 7.1.1 Wireless Basic Settings in Standalone mode.
Channel Width:	Displays the spectral width of the radio channel used by the device. If you want to change it, refer to 5.2 AP List Radio in Cluster mode, 7.1.1 Wireless Basic Settings in Standalone mode.
IEEE802.11 Mode:	Displays the radio standard used for operation of your device. If you want to change it, refer to 5.2 AP List Radio in Cluster mode, 7.1.1 Wireless Basic Settings in Standalone mode.
Max TX Rate:	Displays the maximum data rate at which the device should transmit wireless packets.
Transmit Power:	Displays the maximum average transmit power of the device. If you want to change it, refer to 5.2 AP List Radio in Cluster mode, 7.1.1 Wireless Basic Settings in Standalone mode.

- ## LAN Information

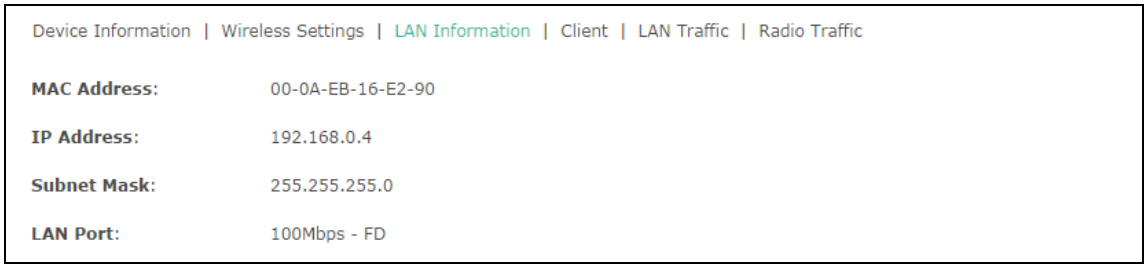


Figure 8-5 LAN Information

MAC Address:	Displays the MAC address of the device.
IP Address:	Displays the IP address of the device.
Subnet Mask:	Displays the subnet mask of the device.
LAN Port:	Displays the maximum transmission rate and duplex mode (half-duplex or full-duplex) of the port.

- ## Client

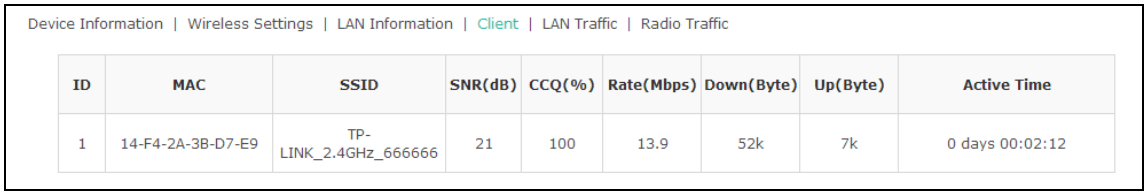


Figure 8-6 Client

MAC:	Displays the MAC address of the client of the AP selected in AP List.
SSID:	Displays the SSID the client is connected to.
SNR(dB):	Signal to Noise Ratio, the power ratio between the received wireless signal strength and the environmental noise strength. The bigger the value of SNR, the better network performance the device provides.
CCQ(%):	Displays the wireless Client Connection Quality (CCQ). CCQ refers to the ratio of current effective transmission bandwidth and the theoretically maximum available bandwidth. CCQ reflects the actual link condition.
Rate(Mbps):	Displays the data rate at which the client transmits wireless packets.
Down(Byte):	Displays the throughput of the downstream data.
Up(Byte):	Displays the throughput of the upstream data.
Active Time:	Displays the amount of time the client has been connected to the device.

- ## LAN Traffic

Click **LAN Traffic** and you can monitor the data transmission status of the LAN port.

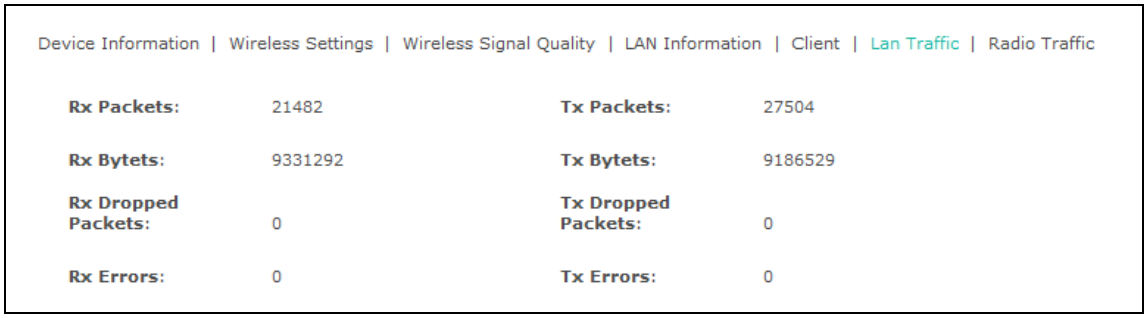


Figure 8-7 LAN Traffic

Rx/Tx Packets:	Displays the total amount of packets received/sent on the LAN port.
Rx/Tx Bytes:	Displays the total amount of data (in bytes) received/sent on the LAN port.
Rx/Tx Dropped Packets:	Displays the total amount of dropped packets received/sent on the LAN port.
Rx/Tx Errors:	Displays the total amount of error packets received/sent on the LAN port.

- ## Radio Traffic

Click **Radio Traffic** and you can monitor the data transmission status of the wireless network.

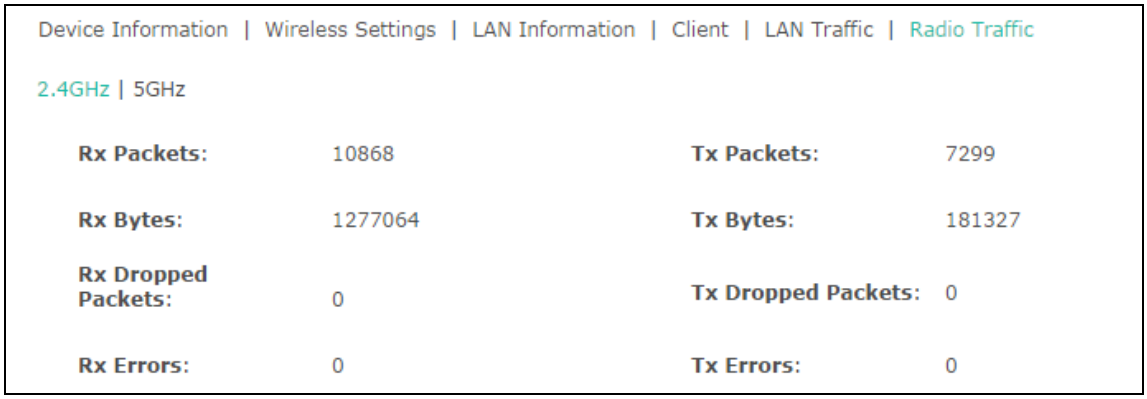


Figure 8-8 Radio Traffic

Rx/Tx Packets:	Displays the total amount of packets received/sent by the wireless network.
Rx/Tx Bytes:	Displays the total amount of data (in bytes) received/sent by the wireless network.
Rx/Tx Dropped Packets:	Displays the total amount of dropped packets received/sent by the wireless network.

Rx/Tx Errors:	Displays the total amount of error packets received/sent by the wireless network.

8.2 SSID

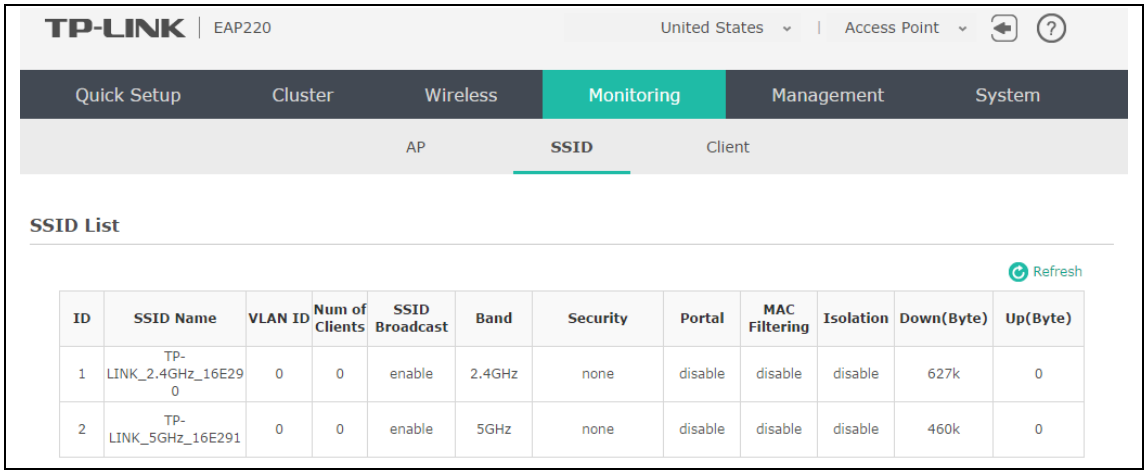


Figure 8-9 SSID Monitoring

8.2.1 SSID List

In SSID List you can monitor the related parameters of the wireless network.

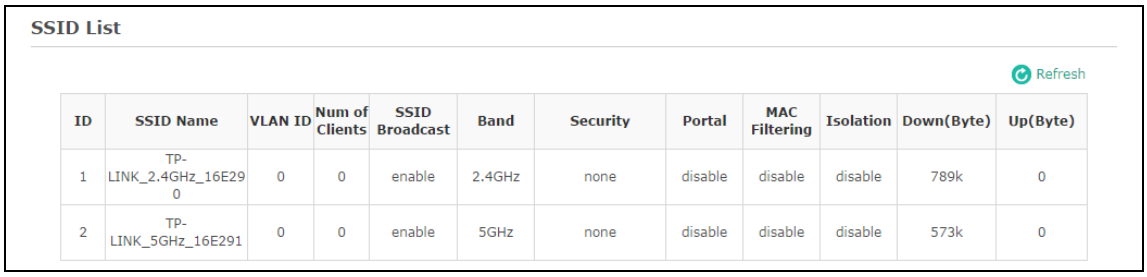


Figure 8-10 SSID List

SSID Name:	Displays the SSID name. If you want to modify it, please refer to 7.1.2 SSIDs.
VLAN ID:	Displays the VLAN which the SSID belongs to. If you want to change the VLAN ID, please refer to 7.1.2 SSIDs.
Num of Clients:	Displays the number of clients connected to the SSID. If you want to get more information about these clients, please refer to 7.1.2 SSIDs.
SSID Broadcast:	Displays the enabling or disabling of SSID broadcast. If you want to modify it, please refer to 7.1.2 SSIDs.
Band:	Displays the frequency band the wireless network is operating at.

Security:	Displays the security mode the wireless network is applying. If you want to modify it, please refer to 7.1.2 SSIDs.
Portal:	Displays the enabling or disabling of Portal. If you want to modify it, please refer to 7.1.2 SSIDs.
MAC Filter:	Displays the enabling or disabling of MAC Filtering. If you want to modify it, please refer to 7.1.2 SSIDs.
Isolation:	Displays the enabling or disabling of SSID Isolation. If you want to modify it, please refer to 7.1.2 SSIDs.
Down(Byte):	Displays the throughput of the downstream data.
Up(Byte):	Displays the throughput of the upstream data.

8.3 Client

From User List, you can monitor the status of all the clients connected to the clustered EAPs including those who are authenticated.

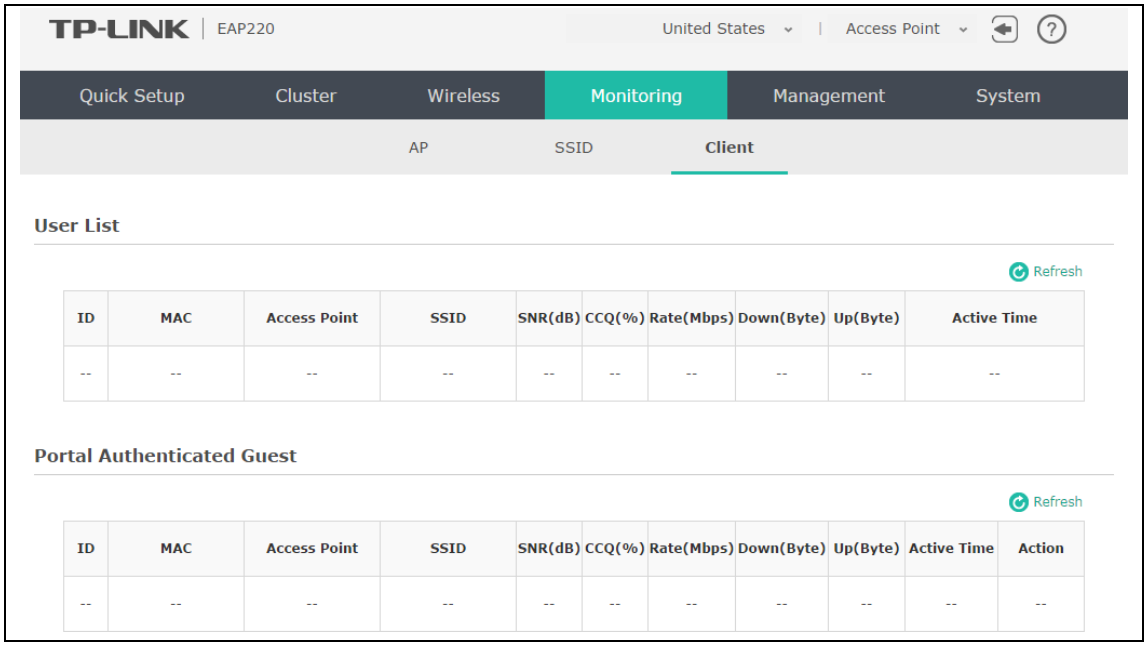


Figure 8-11 Client Monitoring

8.3.1 User List

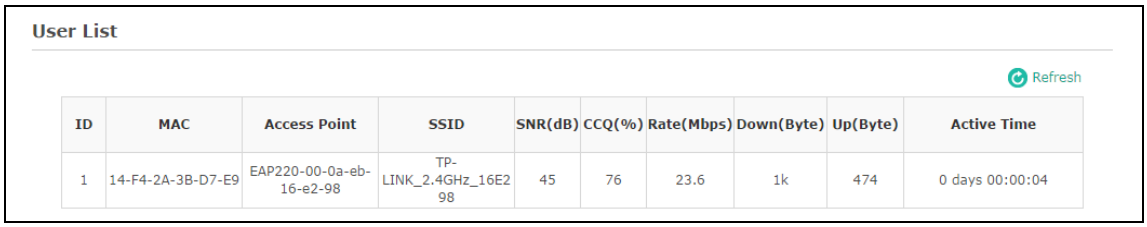


Figure 8-12 User List

MAC:	Displays the MAC address of the client.
Access Point:	Displays the name of the device to which the client is connected.
SSID:	Displays the SSID the client is connected to.
SNR(dB):	Signal to Noise Ratio, the power ratio between the received wireless signal strength and the environmental noise strength. The bigger the value of SNR, the better network performance the device provides.
CCQ(%):	Displays the wireless Client Connection Quality (CCQ). CCQ refers to the ratio of current effective transmission bandwidth and the theoretically maximum available bandwidth. CCQ reflects the actual link condition.
Rate(Mbps):	Displays the data rate at which the client transmits wireless packets.
Down(Byte):	Displays the throughput of the downstream data.
Up(Byte):	Displays the throughput of the upstream data.
Active Time:	Displays the amount of time the client has been connected to the device.

8.3.2 Portal Authenticated Guest

The Portal Authenticated Guest displays information about clients that have set up valid authentication.

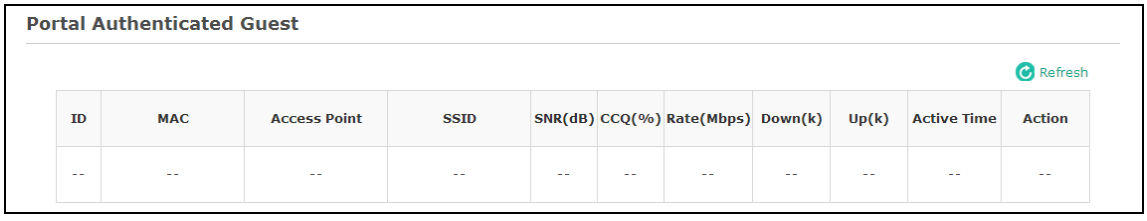


Figure 8-13 Portal Authenticated Guest

MAC:	Displays the MAC address of the authenticated client.
Access Point:	Displays the name of the device to which the authenticated client is connected

SSID:	Displays the SSID the authenticated client is connected to.
SNR(dB):	Signal to Noise Ratio, the power ratio between the received wireless signal strength and the environmental noise strength. The bigger the value of SNR, the better network performance the device provides.
CCQ(%):	Displays the Client Connection Quality (CCQ) of the authenticated client. CCQ refers to the ratio of current effective transmission bandwidth and the theoretically maximum available bandwidth. CCQ reflects the actual link condition.
Rate(Mbps):	Displays the data rate at which the authenticated client transmits wireless packets.
Down(Byte):	Displays the throughput of the downstream data.
Up(Byte):	Displays the throughput of the upstream data.
Active Time:	Displays the amount of time the authenticated client has been connected to the root AP.
Action:	Click **Unauthorize** to stop giving authorization to the clients connected to the wireless network.

Chapter 9 Management

Management page is mainly used for device management and maintenance.

9.1 System Log

System log records information about hardware, software as well as system issues and monitors system events. With the help of system log, you can get informed of system running status and detect the reasons for failure.

Following is the page of System Log.

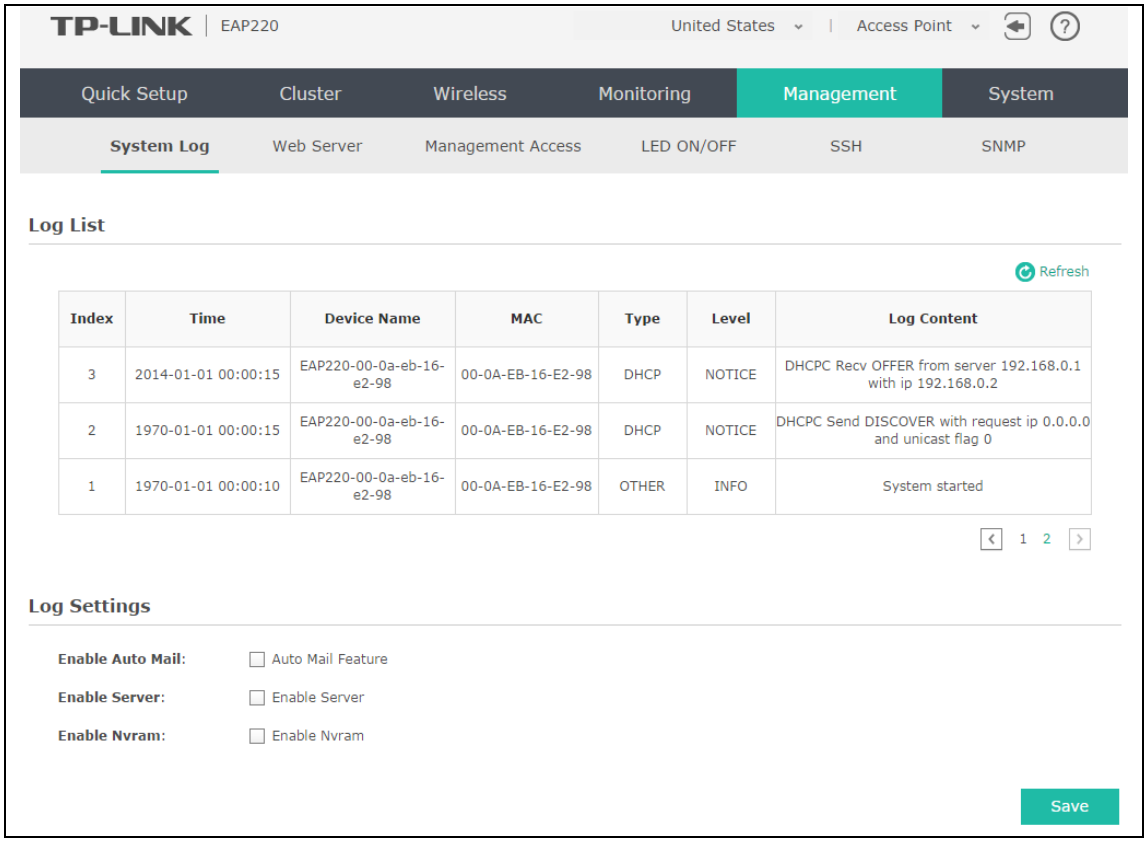


Figure 9-1 System Log Page

9.1.1 Log List

From Log List you can view detailed information about hardware, software, system issues and so on.

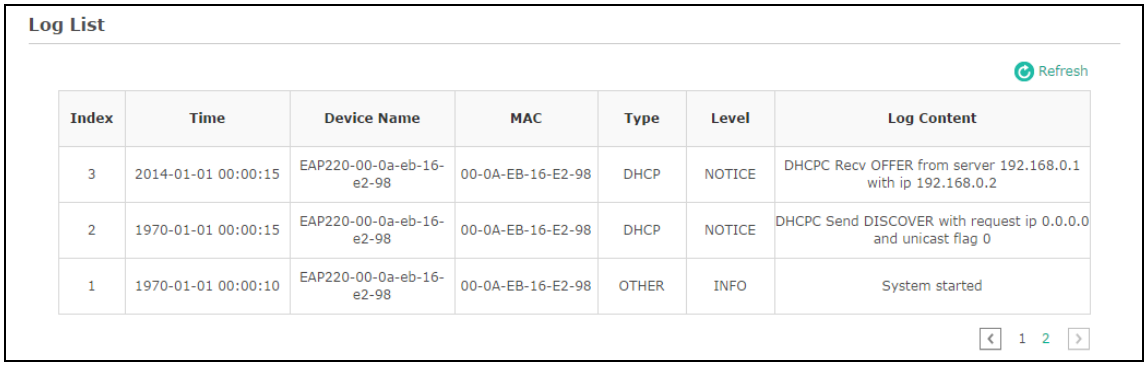


Figure 9-2 Log List

9.1.2 Log Settings

You can choose the way to receive system logs in Log Settings zone, where these parameters can be configured: Enable Auto Mail, Enable Server and Enable Nvram.

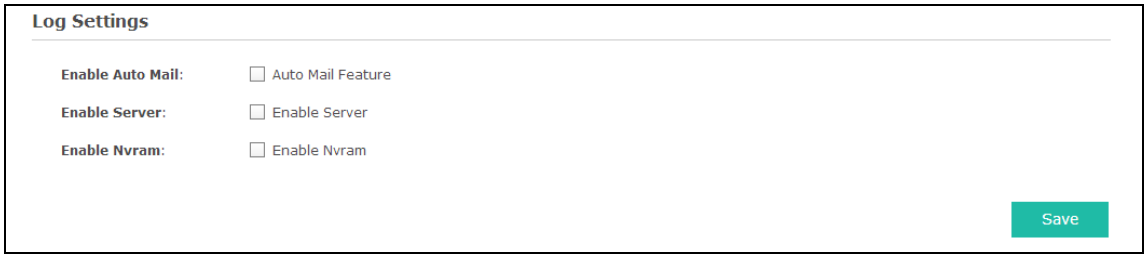


Figure 9-3 Log Settings

- **Enable Auto Mail**

If Auto Mail is enabled, system logs will be sent to a mailbox. The following content will be shown.

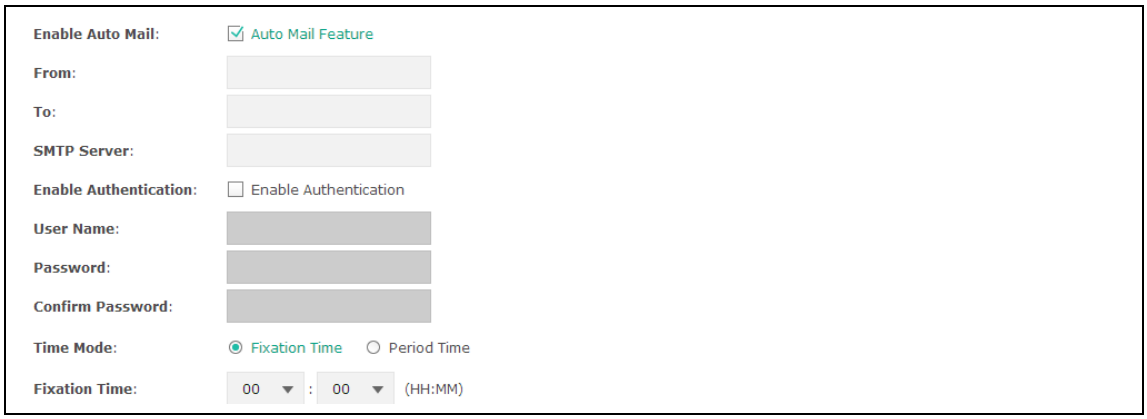


Figure 9-4 Enable Auto Mail

From:	Enter the sender's email address.
To:	Enter the recipient's email address, which will receive the system logs.

SMTP Server:	Enter the IP address of the SMTP server.
Enable Authentication:	Generally users are required to log in to the SMTP server by entering user name and password. • **User Name**: Enter the sender's email address. • **Password**: Enter the password of the sender's email address. • **Confirm Password**: Enter the password again for confirmation.
Time Mode:	System logs can be sent at specific time or time interval. • **Fixation Time**: Set a fixed time, for example, 15:00. The recipient will receive the system logs sent by the device at 15:00 every day. • **Period Time**: Set a time interval, for example, 5 hours. The recipient will receive the system logs sent by the device every 5 hours.

- ### Enable Server

System logs can also be sent to a server. After Auto Mail Feature is enabled, the following content will be shown.

Figure 9-5 Enable Server

System Log Server IP:	Enter the IP address of the remote server.
System Log Server Port:	Enter the port of the remote server.

- ### Enable Nvram

By default, Nvram is disabled. Check the box to enable Nvram, system logs will be saved after power supply is cut.

9.2 Web Server

You can log in web management interface, thereby manage and maintain the device.

Following is the page of Web Server.

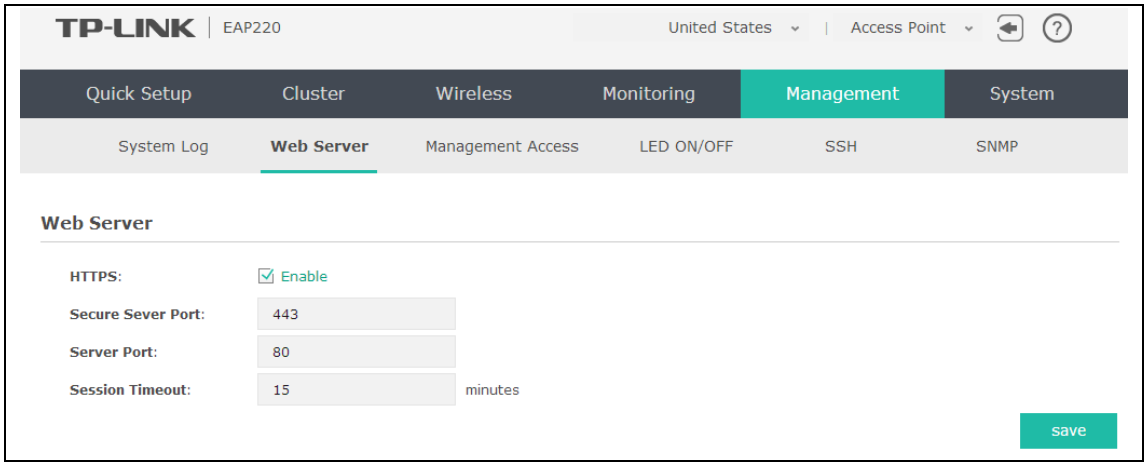


Figure 9-6 Web Server Page

HTTPS:	HTTPS (Hypertext Transfer Protocol Secure) is enabled by default.
Secure Server Port:	Designate a secure server port for web server in HTTPS mode. By default the port is 443.
Server Port:	Designate a server port for web server in HTTP mode. By default the port is 80.
Session Timeout:	Set the session timeout time. If you do nothing with the web management page within the timeout time, the system will log out automatically. Please login again if you want to go back to web management page.

9.3 Management Access

Management Access Control allows you to configure up to four MAC addresses of the hosts that are allowed to log in to the web management page of the EAP. Click **Add PC's MAC** and the MAC address of the current host will be added to MAC address list.

Following is the page of Management Access.

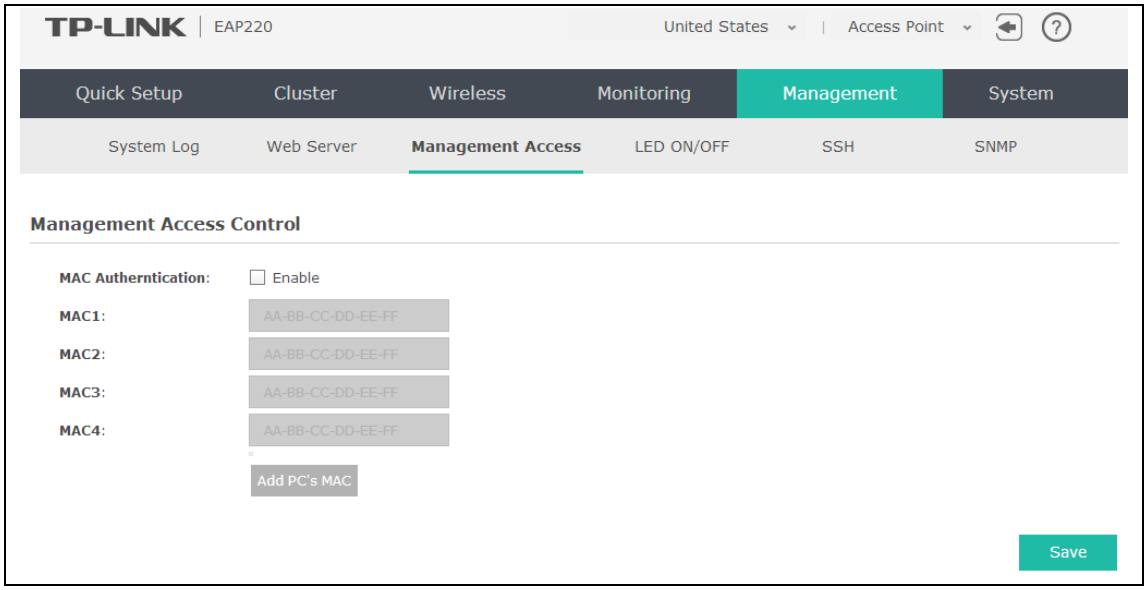


Figure 9-7 Management Access Page

MAC Authentication:	Check the box to enable MAC Authentication. After MAC Authentication is enabled, only the PCs in MAC address list can log in the device's web management page. By default this function is disabled. All PCs in LAN can log in and manage the device.
MAC1~MAC4:	Enter the MAC addresses of the PCs which are authorized to log in the device.

9.4 LED ON/OFF

Following is the page of LED ON/OFF. By default the LED is on.

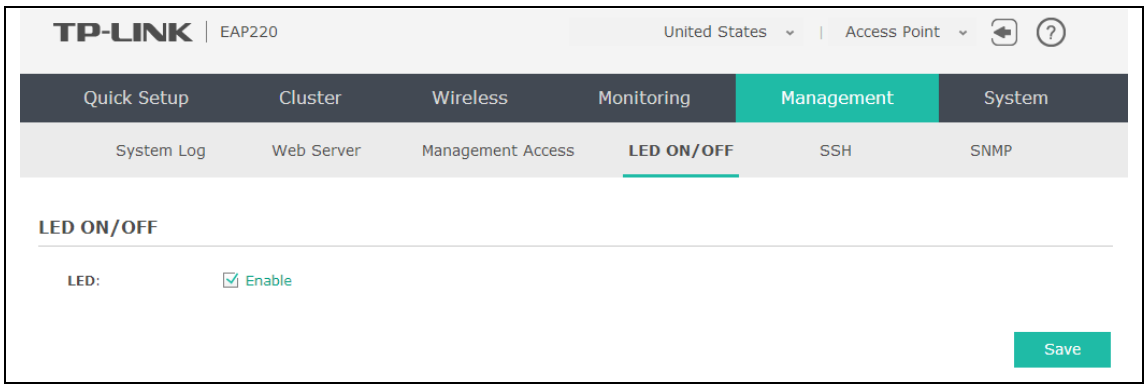


Figure 9-8 LED ON/OFF

9.5 SSH

This device supports the SSH Server function that allows users to login and manage it through SSH connection on the SSH client software.

SSH (Secure Shell) is a security protocol established on application and transport layers. SSH-encrypted-connection is similar to a telnet connection, but essentially the old telnet remote management method is not safe, because the password and data transmitted with plain-text can be easily intercepted. SSH can provide information security and powerful authentication when you login this device remotely through an insecure network environment. It can encrypt all the transmission data and prevent the information in remote management from being leaked.

Following is the page of SSH.

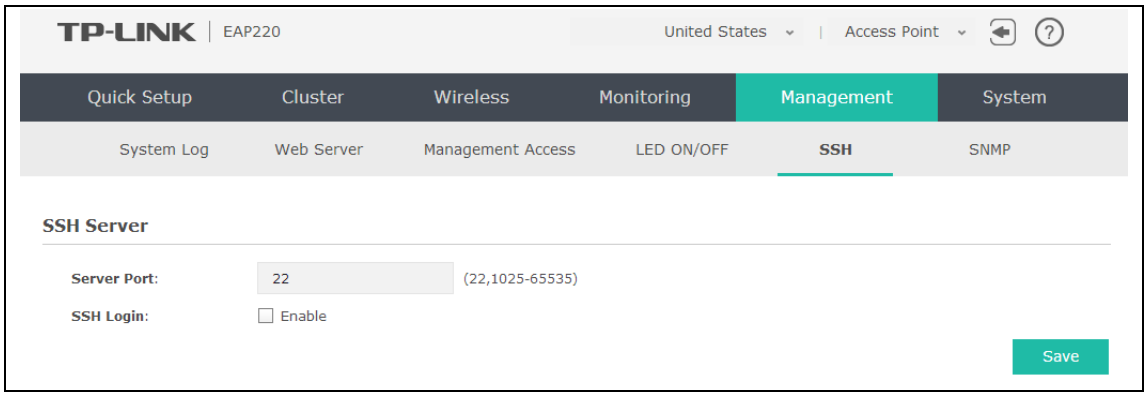


Figure 9-9 SSH Page

Server Port:	Enter the server port. By default, it is port 22.
SSH Login:	Check the box to enable SSH Server. By default, it is disabled.

9.6 SNMP

The device can be configured as an SNMP agent.

SNMP (Simple Network Management Protocol), the most widely applied network management protocol, provides a management framework to monitor and maintain Internet devices. Main functions of SNMP include monitoring network performance, detecting and analyzing network error, configuring network devices, and so on. When networks function properly, SNMP can perform the functions of statistics, configuration and testing. When networks have troubles, SNMP can detect and restore these troubles.

An SNMP consists of three key components: manager, agent and MIB (Management Information Base). SNMP manager is a client program operating at workstation, assisting network administrators to accomplish most network device management tasks. An agent is a network-management software module that resides on a managed device and responsible for receiving and dealing with data sent by managing device. Generally the managed devices are network devices including hosts, bridges, switches and routers. MIB is the collection of managed devices. It defines a series of properties of the managed devices. Every SNMP agent has its own MIB.

Once the device has become an SNMP agent, it is able to receive and process request messages from SNMP manager.

Following is the page of SNMP.

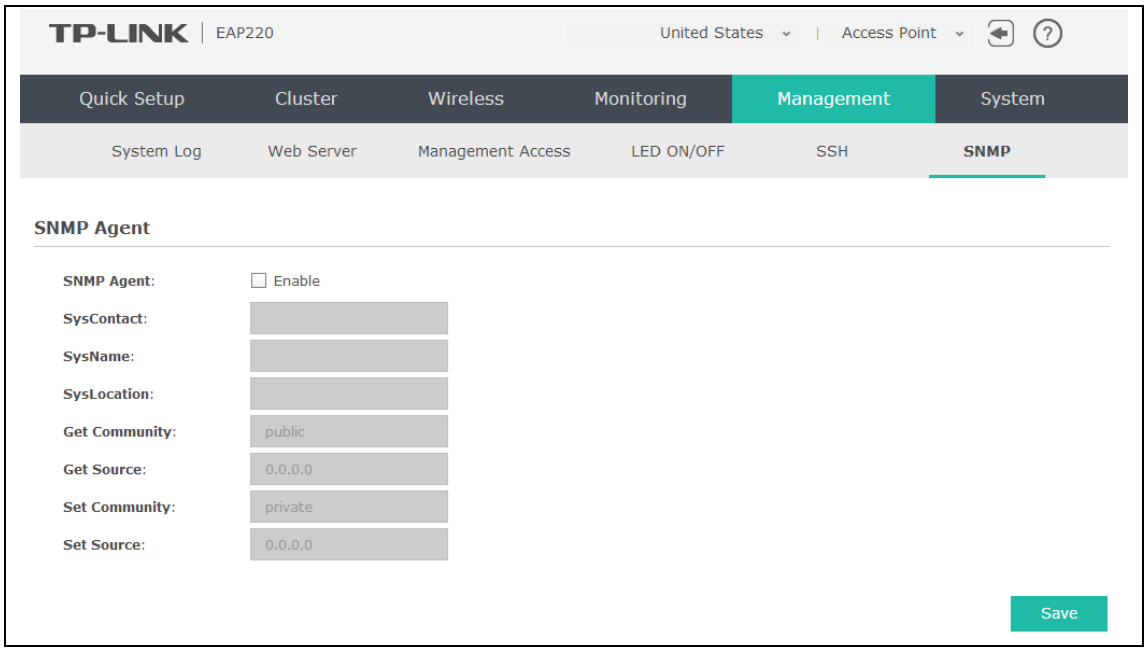


Figure 9-10 SNMP Page

SNMP Agent:	Enable SNMP Agent and the SNMP Agent will collect the information of this device and respond to information requests from one or more management systems.
SysContact:	Enter the textual identification of the contact person for this managed node.
SysName:	Enter an administratively-assigned name for this managed node.
SysLocation:	Enter the physical location of this managed node.
Get Community:	Community refers to a host group aiming at network management. Get Community only has the read-only right of the device's SNMP information. The community name can be considered a group password. The default setting is public.
Get Source:	Defines the IP address (for example, 10.10.10.1) or subnet for management systems that can serve as Get Community to read the SNMP information of this device. The format of subnet is "IP address/bit" (such as 10.10.10.0/24). The default is 0.0.0.0, which means all hosts can read the SNMP information of this device.
Set Community:	Set Community has the read and write right of the device's SNMP information. Enter the community name that allows read/write access to the device's SNMP information. The community name can be considered a group password. The default setting is private.

Set Source:	Defines the IP address (for example, 10.10.10.1) or subnet for management systems that can serve as Set Community to read and write the SNMP information of this device. The format of subnet is "IP address/bit" (such as 10.10.10.0/24). The default is 0.0.0.0, which means all hosts can read and write the SNMP information of this device.

NOTE:

Defining community can allow management systems in the same community to communicate with the SNMP Agent. The community name can be seen as the shared password of the network hosts group. Thus, for the safety, we suggest modifying the default community name before enabling the SNMP Agent service. If the field of community is blank, the SNMP Agent will not respond to any community name.

Chapter 10 System

System page is mainly used to configure some basic information like user account and time, and realize functions including reboot, reset, backup, restore and upgrade the device.

10.1 User Account

You can change the user password to protect your device from unauthorized login. We recommend that you change the default user password on the very first system setup.

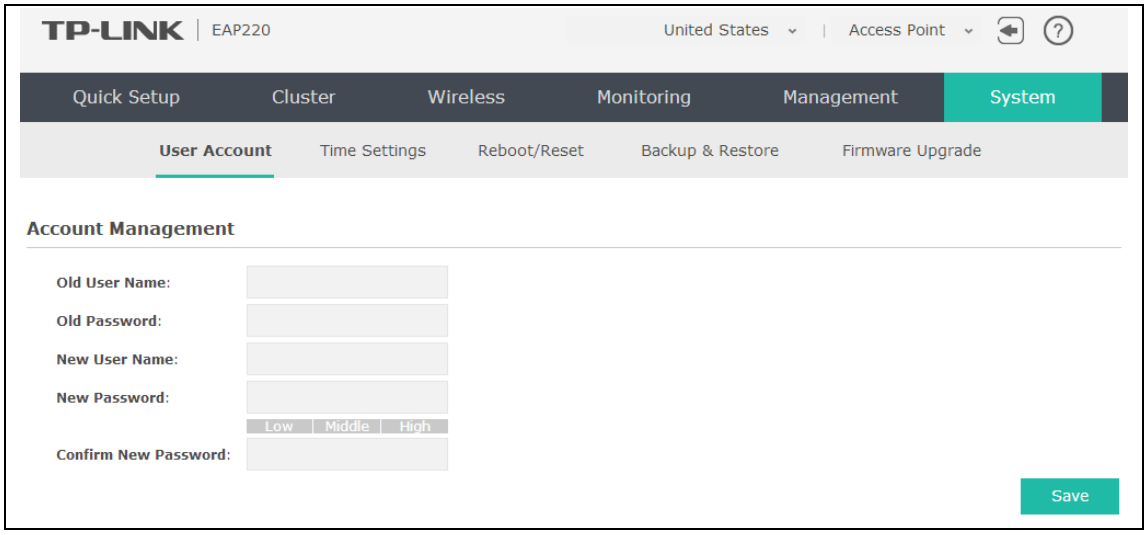


Figure 10-1 User Account Page

Old User Name/Password:	Enter the present user name and password of the admin account to get the permission of modification.
New User Name/Password:	Enter a new user name and password for the admin account. Both values are case-sensitive, up to 64 characters and with no space.
Confirm New Password:	Enter the new password again.

10.2 Time Settings

System time represents the device system's notion of the passing of time. System time is the standard time for Scheduler and other time-based functions. You can manually set the system time, configure the system to acquire its time settings from a preconfigured NTP server or synchronize the system time with the PC's clock.

The device supports DST (daylight saving time).

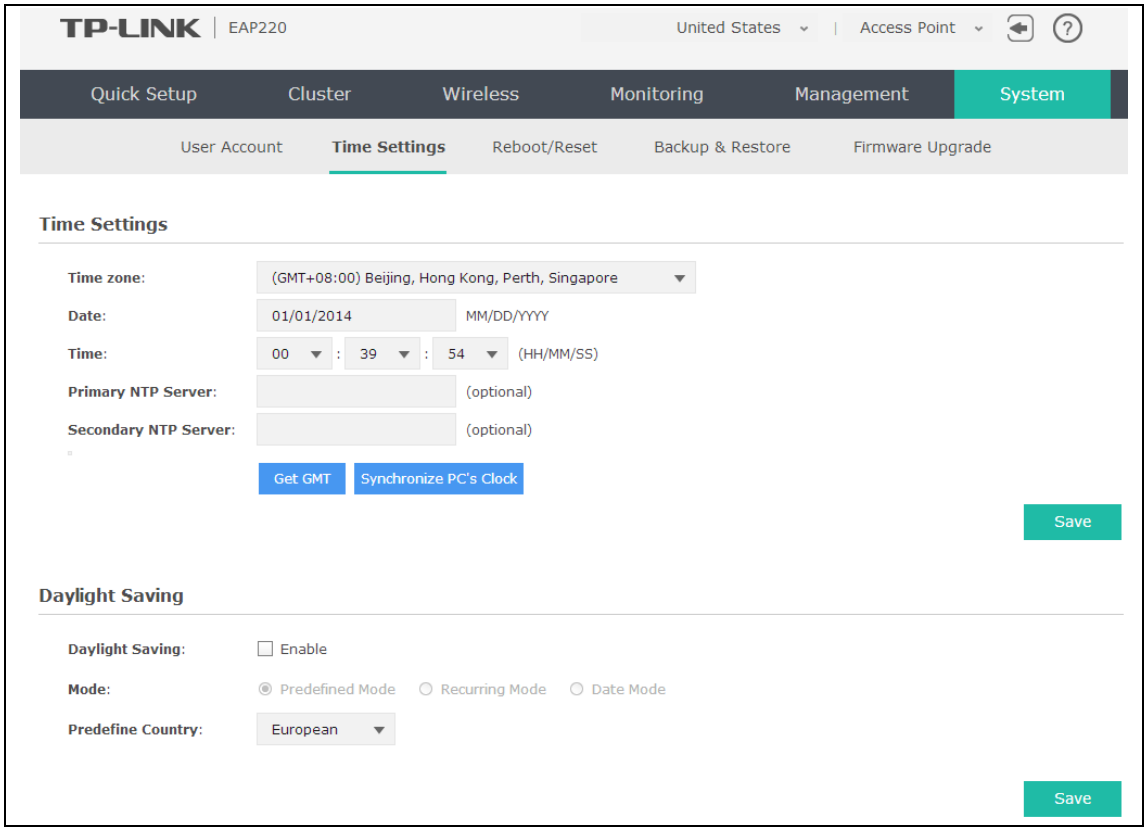


Figure 10-2 Time Settings

10.2.1 Time Settings

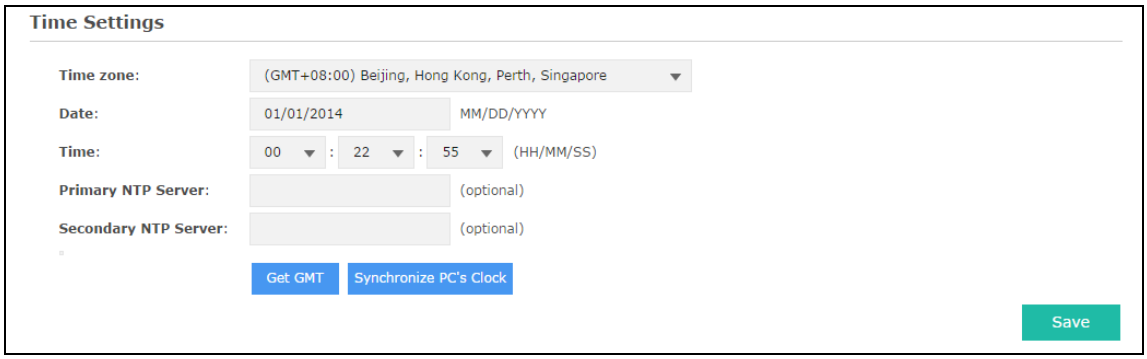


Figure 10-3 Time Settings

Get GMT	Click the button and the device will obtain GMT time from NTP server. IP address of the NTP server has to be filled in.
Synchronize PC's Clock	Click the button, your PC's time will be obtained as the device's system time.
Time zone:	Select your local time zone from the drop-down list.
Date:	Set the current date, in format MM/DD/YYYY. For example, for November 25, 2014, enter 11/25/2014 in the field.

Time:	Specify the device's time. Select the number from the drop-down list in time format HH/MM/SS.
Primary/Secondary NTP Server:	If you've selected **Get GMT** from an NTP server, please input the primary NTP sever address and an alternative NTP server address.

10.2.2 Daylight Saving

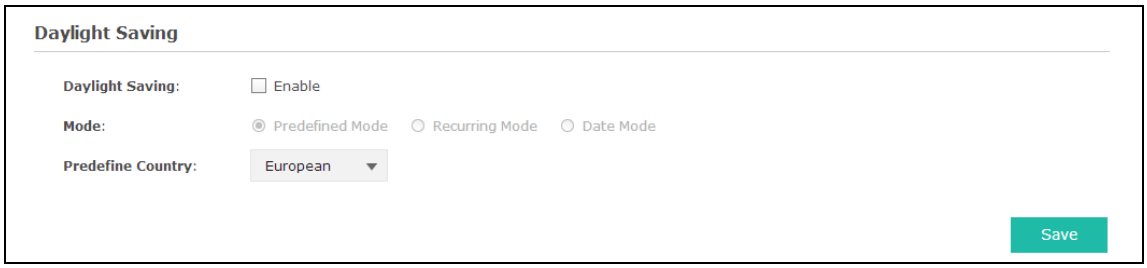


Figure 10-4 Daylight Saving

Daylight Saving:	Enable or disable the DST. DST is disabled by default.
Mode:	Options include Predefined Mode, Recurring Mode and Date Mode. Please refer to the following content for more information.

- **Predefined Mode**

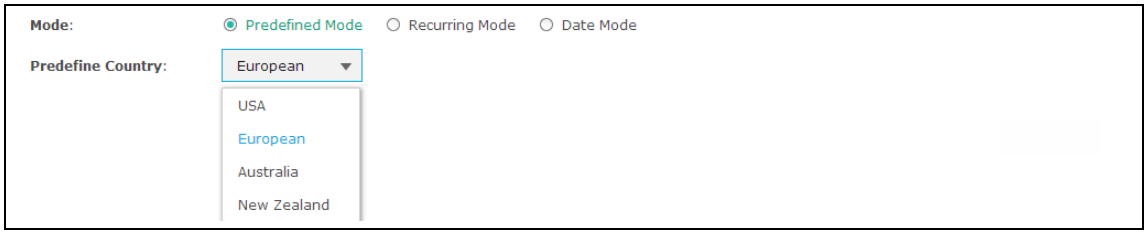


Figure 10-5 Predefined Mode

Mode:	Select **Predefined Mode**.
Predefine Country:	Select a predefined DST configuration. Europe is the predefined country by default. • **USA**: Second Sunday in March, 02:00 ~ First Sunday in November, 02:00 • **European**: Last Sunday in March, 01:00 ~ Last Sunday in October, 01:00 • **Australia**: First Sunday in October, 02:00 ~ First Sunday in April, 03:00 • **New Zealand**: Last Sunday in September, 02:00 ~ First Sunday in April, 03:00

- **Recurring Mode**

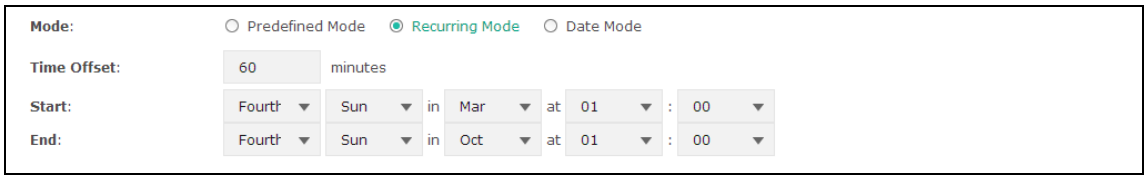


Figure 10-6 Recurring Mode

Mode:	Select **Recurring Mode**. The configuration is recurring in use.
Time Offset:	Specify the time adding in minutes when Daylight Saving Time comes.
Start/End:	Select starting time and ending time of Daylight Saving Time.

- **Date Mode**

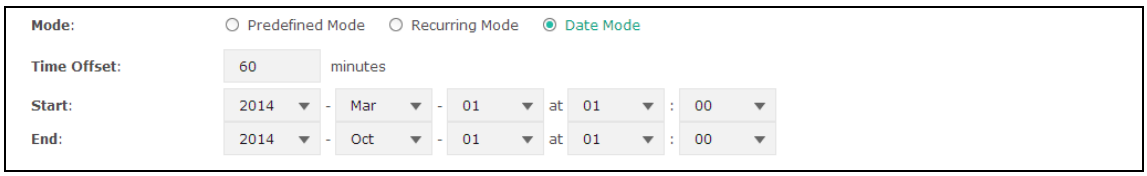


Figure 10-7 Date Mode

Mode:	Select **Date Mode**.
Time Offset:	Specify the time adding in minutes when Daylight Saving Time comes.
Start/End:	Select starting time and ending time of Daylight Saving Time.

10.3 Reboot/Reset

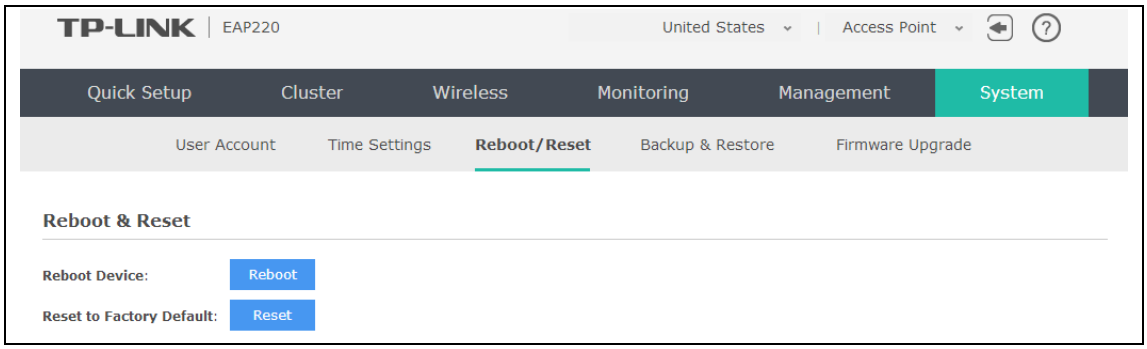


Figure 10-8 Reboot & Reset

Click **Reboot** to restart the device. Click **Reset** to restore the device to factory default settings.

NOTE:

Clicking **Reboot/Reset** will reboot/reset all the EAPs in a cluster.

10.4 Backup & Restore

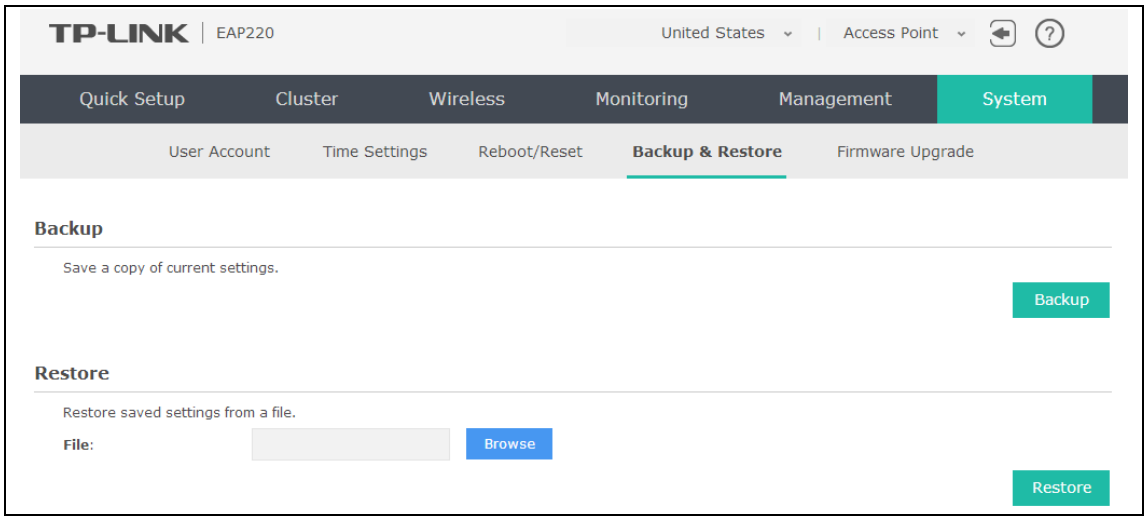


Figure 10-9 Backup & Restore

You can save the current configuration of the EAP as a backup file and restore the configuration via a backup file. Back up the settings before you upgrade the device or upload a new configuration file can prevent it from being lost.

Restore function helps you to restore the device to previous settings by uploading a backup file.

10.5 Firmware Upgrade

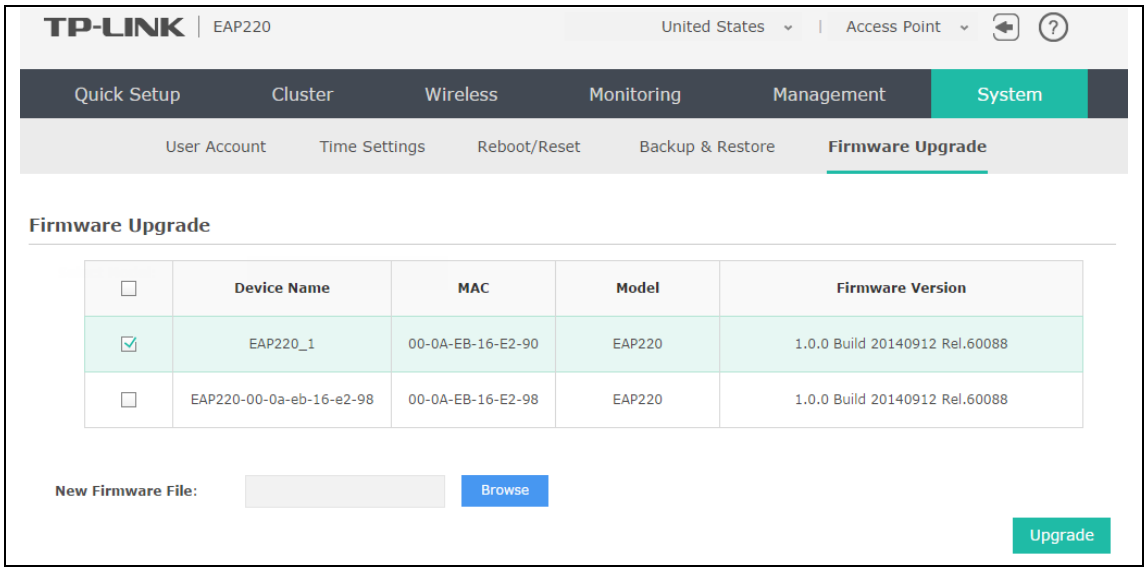


Figure 10-10 Firmware Upgrade

Please log in http://www.tp-link.com/en/ to download the latest system file. As Figure 10-10 shows, firstly select the model and device you are planning to upgrade. Then click **Browse** and choose the firmware file. Finally click **Upgrade** to upgrade the devices.

NOTE:

1. Please select the proper software version that matches your hardware to upgrade.
2. To avoid damage, please do not turn off the device while upgrading.
3. After upgrading, the device will reboot automatically.

Appendix A: Specifications

Models	EAP120	EAP220
HARDWARE FEATURES		
Interface	10/100/1000Mbps Ethernet port (RJ-45) Console port (RJ-45) Power connector (DC-2) Kensington lock slot	
Buttons	RESET ON/OFF (for power supply)	
PoE Compatible	802.3af	
Power Supply	PoE (36~57VDC, 0.2A Max) or External 12VDC/1A Power Supply	PoE (36-57VDC, 0.4A Max) or External 12VDC/1.5A Power Supply
Maximum Power Consumption	4.4W	9.6W
Antenna	2*4dBi Embedded	4*4dBi Embedded
Mounting	Ceiling/Wall mounting (kits included)	
Certification	CE FCC RoHS	
Operating Temperature	0℃~40℃ (32℉~104℉)	
Operating Humidity	10%~90% non-condensing	
WIRELESS FEATURES		
Wireless Frequency	2.4GHz	2.4GHz & 5GHz
Wi-Fi Standard	IEEE 802.11b/g/n	IEEE 802.11a/b/g/n
Maximum Data Rate	Up to 300Mbps	Up to 600Mbps
Max RF Transmission Power	23dBm	2.4GHz:23dBm 5GHz:20dBm
Multiple SSIDs	Up to eight per radio	
Captive Portal Authentication	Support	
Wireless Security	WEP WPA/WPA2-personal WPA/WPA2-enterprise	
Cluster	Support up to 24 APs in a cluster	